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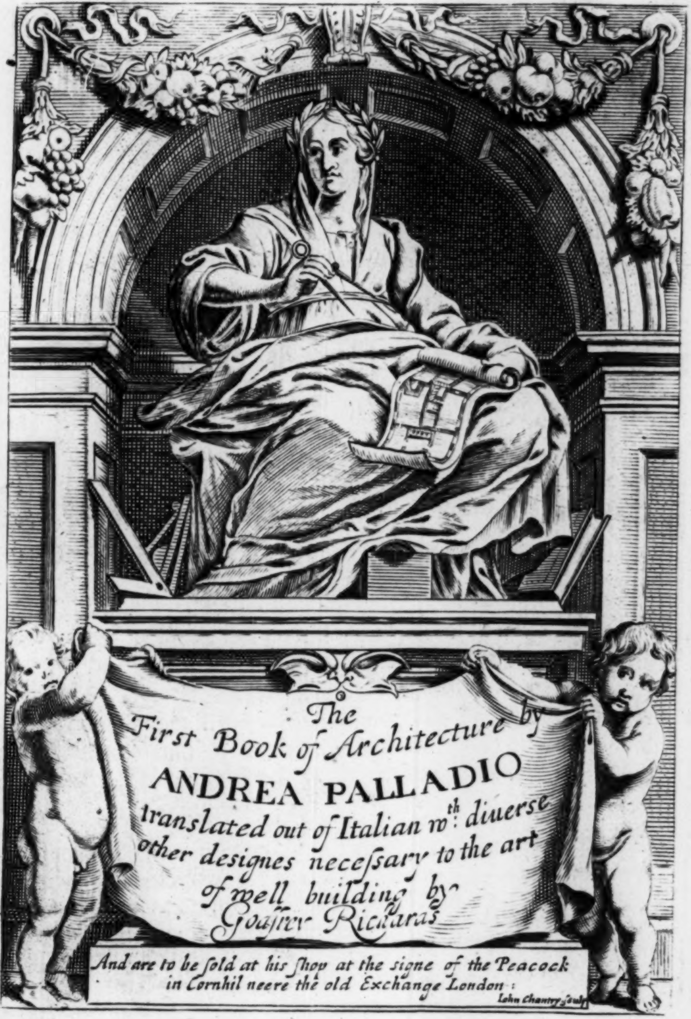

# The First Book of Architecture by ANDREA PALLADIO

translated out of Italian wth: diuerse
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of well building by
Godfrey Richards

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John Chantry ſculp

# THE FIRST BOOK OF *Architecture*,

BY

*ANDREA PALLADIO.*

Tranſlated out of *ITALIAN*:

With an Appendix Touching

**DOORS and WINDOWS,**

By P$^{r}$ *LE MUET* Architect to the *French* King.

---

Tranſlated out of *French* by *G. R.*

---

ALSO

Rules and Demonſtrations, with ſeveral Deſigns for the Framing of any manner of *Roofs* either above *pitch* or under *pitch*, whether *Square* or *Bevel*, never publiſhed before.

WITH

Deſigns of *Floors* of variety of ſmall pieces of Wood, lately made in the Pallace of the Queen Mother, at *Sommerſet-Houſe*; a curioſity never practiſed in *England* before.

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*The Fourth Edition Corrected and Enlarged. With the new Model of the Cathedral of St.* Paules *as it is now to be built.*

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*LONDON*,
Printed for *T. Paſſinger* at the three Bibles on *London-bridge*,
*T. Sawbridge* at the three Flower-de-luces in *Little Britain*, and *R. Smith*
at the Bible under the *Piazza* of the *Royal Exchange*, 1683.

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## To my Worthy and much Honoured Friend, *DANIEL COLWAL*, Eſq.

*SIR,*

BEing very ſenſible of the many Favours which you have a long time been pleaſed to afford me, I dare no longer delay to acknowledge my Obligation: Although with the Addition of your farther trouble, in deſiring your Peruſal and Allowance of this Tranſlation, wherein if you ſhall think that I have done the Author no leſs right then he hath done the Subject, I ſhall not doubt of the approbation of all other Ingenious perſons; and that our Artiſts having ſuch Examples will make it as much eſteemed here as abroad; and it is only for their ſervice that I have undertaken this work. I confeſs I ought to preſent you ſomething ſuitable to thoſe higher Studies wherein you have with ſo much ſucceſs exerciſed your ſelf, and not by any thing inferiour,

our, divert you from the Philoſophical and Sublime Entertainments, which you find in that Royal Society at *Greſham-Colledge*, whereof you are a Worthy Member. But this being intended for an aſſiſtance to our Ingenious Workmen, and Improvement of Engliſh *Architecture*; I ſhall therefore hope for your Patronage, and that you will own me in this, as in all other occaſions, to be,

*Sir,*

*Your moſt Humble and*

*Obliged Servant,*

Godfrey Richards.

THE

# THE PREFACE

THE *Subject of this Tranſlation, being* Architecture, *doth, in the opinion of* Sr. Hen. Wotton, *need no Commendation, where there are Noble Men or* Noble *Minds: Therefore I ſhall only give you an accompt of the Authors, and my own concernment herein: He was* Andrea Palladio, *a famous Architect of* Italy, *where taking notice of the Irregularities and Deformities in Building, introduced by invaſions of the* Gothes, *and other* Barbarians; *to prevent thoſe inconveniences for the future, he thought fit to inſtruct the world in the Rules and Practices of the Learned Ancients; having opportunity to obſerve the foot-ſteps of their labours even at* Rome *it ſelf, where being the greateſt Concourſe of Noble Men and Noble Minds, they ſpared neither Care nor Coſt in Building: And in Imitation of them, our Author is exact in his directions touching every material, as in the choice of* Stone, Timber, Metals, Sand, Lime, Brick, &c. *what good, and what not, how to be prepared and put in uſe. 'Tis obſerved how careful they were in the making their* Brick *and* Lime, *not forbearing the hardeſt* Stone; *for as Sr.* Henry

Wotton *obſerveth, that the* Italians *to this day, and much more the Ancients, did burn their firmeſt* Stone, *and even* Marble *it ſelf, where it was plentiful, which in time became* Marble *again, or at leaſt of Indiſſoluble Durity, as appeareth in the ſtanding Theatres. And other Learned Men have required that all the Timber be cut out of the ſame Forreſt, all the* Stone *out of the ſame Quarry, and the* Lime *be made out of the ſame* Stone *of which the Building is intended, imagining that they will Sympathize and joyn better by a kind of* Original *Kindred. But inſtead of this Curioſity, we too often make* Lime *without any great choice, and of Refuſe Stuff, which is an Engliſh Errour, of no ſmall moment in our Buildings. After theſe Particulars, our Author proceeds to treat of the Five Orders of* Columns, *whoſe Members and Proportions, as he hath laid them down, are by the Judicious eſteemed the moſt excellent in their kind; and for ſome of their terms which I have changed, it was not without the advice of Skilful Artiſts, thereby to conform to thoſe terms moſt familiar to our Work-men. To theſe are added Deſignes of* Doors and Windows, *by* Pr Le Muet, *Architect to the* French King; *which I thought good to preſent (* Palladio *only* *diſcourſing of them* ) *they being well approved by all Artiſts, both for their manner and Proportions, and the ſame which are in the* Louvre *at* Paris ; *and out of him I have given the Proportion of* Halls *and* Chambers, *though a little differing from* Palladio, *becauſe moſt agreeing to the preſent practice both in* England *and* France: *And for the ſame Reaſon, I do, inſtead of* Monſieur Muets *Deſigns of Frames of Houſes, put in ſuch as are uſed in* England, *by the direction of ſome of our ableſt* Architects, *which* (*I hope*) *will be grateful, and very uſeful, not only to our Artiſts, but Gentlemen and others which may have occaſion to Build; giving an account of all the Names proper to each Member and principal of the* Houſe ; *and alſo ſhew the manner of framing, with their ſeveral* Scantlings *and* Buttments.

*Although we want not ſuch ingenious Artiſts whoſe names deſerve to be Celebrated for many ſtanding Examples of their skill, which do better deſerve deſcription then many publiſhed with much pomp beyond the Seas : Yet we have but few Books which I can recommend to you, beſides the Excellent diſcourſes of Sir* H. Wotton *and* John Evelyn *Eſq;* *the former on the Elements of Architecture, and the latter in his accompt of*

*Architecture and Architects (added to his Elegant Tranſlation of the* Parallel*) where they having compriſed fully and clearly the moſt weighty obſervations of the Art in general, the ſtudious will need only to ſerve himſelf of the particular parts thereof, according to his own occaſions.*

*And ſuch Pieces as I here preſent, the Reader cannot think unſeaſonable, now that a new and great City is to be built, wherein the King having ſhewn his particular care of keeping the Trade in its former channel, by fixing the* Exchange, Cuſtom-houſe, *&c on their old foundations, and the Laws having provided for ſuch a way of building, as may joyn together (what our Author requires to be obſerved by every undertaker)* Accomodation, Handſomneſs, *and* Laſtingneſs, *and prevent that deformity and danger which we have formerly been liable to, by Irregular and ſlight buildings, narrow Streets, intollerable encroachments, jettings of windows, and what not, that might make it combuſtible. I hope now both old and young will rejoyce at the re-building of* London, *a ſecond happy reſtoration, inferiour only to that of his* Majeſties *Perſon and Government.*

G R.

# THE FIRST BOOK OF ARCHITECTURE,

## By ANDREA PALLADIO.

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## CHAP. I.

## *What ought to be conſidered and prepared, before you begin to build.*

BEfore you begin to Build, you ought carefully to conſider every part of the Foundation and Ground-work of the Building which is to be raiſed. Three things in a Building (as ſaith *Vitruvius*) ought to be conſidered, without which it will not deſerve commendation: Thoſe are uſefulneſs or accommodation, laſtingneſs and handſomneſs: For that work cannot be accounted perfect, which is uſeful but only for a ſhort time, or not convenient for a longer; or having theſe two, hath not alſo decency: It will be commodious, when every part hath its due place and fit ſcituation, not below its indignity, nor above what its uſe requires; and they will be fitly diſpoſed, when the Galleries, Halls, Chambers, Cellars, and Granaries are in their proper places. As for the laſtingneſs, you regard that when all the Walls are right by the line, thicker below then above, and have good and ſufficient foundations;

and beſides, the pillars above muſt be directly over the pillars below. And all the Apertures (as Doors and Windows) muſt be one above the other, ſo that the ſolid be upon the ſolid, and the vacant be upon the vacant. The handſomneſs will ariſe from the fair form, and the correſpondence between the whole and its parts, of the parts among themſelves, and of them to the whole: Becauſe that a building ought to appear an intire and perfect body, wherein each member agrees with the others, and all the members be neceſſary to what you deſign.

Theſe things conſidered, in the deſign and model, you ought then diligently to calculate all the charge that may ariſe, and make timely proviſion of money, and prepare what materials ſhall ſeem requiſite: So that in building nothing may be deficient, and hinder the Complement of the work, it being no little praiſe to the builder, nor ſmall advantage to the work, that it be finiſhed with due expedition: And that all the Walls be at once laid out, and equally diſpatched, from whence there will be none of thoſe clefts which uſually are ſeen in Fabricks finiſhed unequally, and at divers times.

And therefore having choſen the moſt skilful Artiſts that you can get, that ſo the work may be the better carried on, by their advice: you are to provide Timber, Stone, Sand, Lime, and Metal; concerning which proviſion, you ſhall have ſome Advertiſements, as to frame the Joiſts of the Hall and Chambers, provide your ſelf with ſo many Joiſts, as when framed, there may remain between them the ſpace of a Joiſt and half.

In like manner, concerning Stone, you are to take notice, that to make the Jaumes of Doors and Windows, you are not to have ſtone bigger then a fifth, nor leſs then a ſixth part of the light; and if you intend to adorn the building with Pillars or Pillaſters, make the Baſes, Capitels, and Architraves of Stone, and the other parts of Brick.

Beſides, as for the Walls, you are to conſider, that they ought to diminiſh according as they riſe; which inſtruction will ſtate the account right, and leſſen great part of the charge: And becauſe all theſe parts may be diſcourſed of in their particular places, it ſhall ſuffice to have here given this general advice, which is as a rough draught of the whole building.

But beſides the quantity, you are alſo to conſider the quality and goodneſs of the materials, to chuſe the beſt; experience gained from the building of others will be a great help, becauſe thereby we may eaſily know how to determine what is fit and expedient to our own purpoſe. And although *Vitruvius*, *Leon Battiſta*, *Alberti*, and other excellent Writers, have taught what is requiſite in the choice of materials; yet that nothing may be wanting in theſe Books of mine, I ſhall ſpeak of ſome, confining my ſelf to the moſt neceſſary.

## CHAP. II.

## *Of Timber.*

TImber (*Vitruvius* hath it, *cap.* 9. *book.* 2.) ought to be felled in *Autumn*, and through all the *Winter*: becauſe then the Trees recover from the Root that ſtrength and ſoundneſs which in the *Spring* and *Summer* was diſperſed into leaves and fruit; and you are to cut them in the wane of the Moon, becauſe the moiſture which is moſt apt to rot wood, is then conſumed: From whence there will not come the worm to hurt it. It ſhould be cut but to the middle of the pith, and ſo left until it be dry, becauſe by drops there will paſs away that moiſture which would cauſe putrefaction; being cut, let it be laid in a place free from the extremity of the Sun, Wind and Rain; and thoſe ought chiefly to be kept dry, which are of ſpontaneous growth; and to the end that they may not cleave but dry equally, you are to daub them over with Cow-dung; it ſhould not be drawn through the dew, but in the afternoon, nor to be wrought being very wet or too dry: Becauſe the one makes it apt to rot, the other hard to work; nor will it in leſs then Three Years be dry enough, to uſe in Plankes, Doors and Windows. It is convenient for thoſe who are about to build, to inform themſelves from men skilful in the nature of Timber, what Wood is fit for ſuch uſe, and what not. *Vitruvius*, in the Chapter above mentioned gives good inſtructions ; and ſo other learned men who have written thereof at large.

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# CHAP. III.

## Of Stone.

SOme are *Natural*, ſome *Artificial* : The *Natural* are hewn out of the Quarry, and are either to make lime or to build walls ; of thoſe which are uſed for Lime, ſhall be ſpoken hereafter ; thoſe of which walls are built, are either Marble and hard Stone, or elſe ſoft and pliant. Marble, and hard Stone is to be wrought, as ſoon as digg'd ; for it will be at that time more eaſie to work, then when it hath remained a while in the Air : Seeing the longer they are out of the Quarry, they become the harder, and muſt ſuddenly be put in hand. But the ſofter the Stone ( eſpeciall where its nature and ſufficiency is not underſtood, as when 'tis digg'd in a place from whence formerly none has been taken ) ought to be digg'd in *Summer*, and expoſed to the Air, and not to be uſed within two years ; it muſt be digg'd in *Summer*, to the end that not being uſed to Wind, Rain, and Froſt, it may by degrees grow hard, and inabled to reſiſt thoſe injuries of the weather ; and it ſhould be left ſo long, that thoſe which have been prejudiced may be put in foundations ; and the others not ſpoiled ( upon trial ) are to be uſed above ground in Buildings, becauſe they endure longeſt.

*Artificial* Stones, are from their form commonly called *Quadrels* ; theſe are made of a chalkie, whitiſh, and pliable Earth ; you muſt by all means avoid that which is gravelly and ſandy ; the Earth muſt be digged in *Autumn*, and tempered in *Winter*, and ſo they may be well made in the *Spring* ; but if neceſſity forces you to make them in the *Winter* or *Summer*, cover them in *Winter* with dry ſand, and in *Summer* with ſtraw : when made, they require a longer time to dry; and 'tis beſt that they dry in the ſhade, ſo that not only the outſide, but the middle and all parts may be equally hardned, which cannot be done in leſs then two years. They are made bigger or leſs according to the quality of the building, and the uſe to which they are intended; therefore the Ancients made their bricks for publick and great buildings, larger then for ſmall and private: The bigger ſort ought to be hollowed in many places, that ſo they may dry and bake the better.

## CHAP. IV.

## *Of Sand.*

THere are three ſorts of Sand, that is to ſay, Pit-Sand, River-Sand, and Sea Sand. Pit-Sand is of all the beſt, and is black, white, red, or cindry, which is a ſort of Earth burnt by fire incloſed in the Mountains, and digged up in *Tuſcany*. There is alſo digged in *Terra di Lavoro*, in the Territories of *Baio* and *Cuma*, a Sand called by *Vitruvius*, *Pozzolana*, which ſuddenly knits together in water, and makes building very ſtrong; it hath been found by long experience, that of all Pit-Sand, the white is the worſe: And of River-Sand, that from the ſtream which is found in the falls of water is the beſt, becauſe it is more purged. The Sea-Sand is worſt of all, and blackens and ſhines like glaſs, but that is better which is neareſt the ſhore, and bigger. The Pit-Sand, becauſe 'tis fat and tough (but apt to cleave) is therefore uſed in Walls and long Vaults. The River-Sand is very good for the covering, or rough-caſting of Walls. Sea Sand, becauſe 'tis ſoon wet and ſoon dry, and moulders away by reaſon of *the Salt*, therefore is unfit to bear weight. All Sand is beſt in its kind, if being ſqueezed and handled, it crackles; and if being put upon a white cloth, it neither ſtains nor leaves it foul: That is bad, which mingled with water, makes it dirty and muddy, and which has for a long time been in the Air, Sun, Moon, and Froſt, becauſe it will retain much Earth and rotten humour, apt to bring forth ſhrubs and wild fig-trees, which are greatly hurtful to buildings.

## CHAP. V.

## *Of Lime, and how to work it.*

STones, whereof Lime is made, are either digg'd out of the Hills, or taken out of the Rivers: All Stones of the Hills are good, which are dry without any moiſture, and brittle, having no material in it, which when it paſſeth the fire ſhall leave the Stone leſs; therefore that Lime will be beſt which is made of the hardeſt, ſound, and white Stone, and being burnt remains a third part lighter then its Stone. There are alſo certain ſorts of Stone, the Lime whereof is very good for the ſetting of walls. In the Hills of *Padua* they dig a rugged Stone, whoſe Lime is very good in works which lie open, and in the water, becauſe it preſently hardens, and endures very long. All digg'd Stones are better to make Lime, then the gathered; and from a ſhady and moiſt pit, rather then a dry: The white is better to work then the brown; Stones which are gathered in Rivers and Brookes, that is to ſay, Pebbles, make excellent Lime, and very white, and neat work; therefore 'tis generally us'd for finiſhing of Walls. All Stones, as well of the Hills as Rivers, are ſooner or later burnt, according to the fire which is given them; but ordinarily they are burnt in ſixty hours: Being burnt, wet them, but not pour on the water all at once, but at divers times, and frequently (that they may not burn) till they be well tempered: Afterwards put them in a moiſt and ſhady place without any mixture, only cover them lightly with Sand; and by how much the more thorowly they are ſteeped, ſo much the more rough and better they will be: Except thoſe which are made of rough Stones, as the *Paduan*, becauſe they, as ſoon as they are wet, muſt be wrought, otherwiſe they waſte and burn away; whence they will not hold, but become uſeleſs: For to make the Mortar, you muſt ſo mix the Sand, that taking of Pit-Sand, you muſt put three parts thereof with one of Lime; if River or Sea-Sand, two parts thereof with one of Lime.

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## CHAP. VI.

## *Of Metals.*

THE Metals uſed in buildings are Iron, Lead, and Copper: Iron ſerves to make Nails, Hinges, and Chains, to faſten the Doors, to make Doors themſelves, Grates, and the like works. It is no where found, and digged pure, but when digged is purged by the fire, to the end it may be ſo melted, that it may run, and that before it be cool, the foulneſs may be taken away; but after it is purged and cooled, it heats well, and becomes ſoft, and eaſie to be wrought and beat out with a hammer. But it will not eaſily melt, if it be not put again into a fornace made for that purpoſe; if being red hot, it do not work nor yield to the hammer, it waſtes and is ſpoiled. 'Tis a ſign of the goodneſs of Iron, if in the maſs you ſee the veins continued ſtraight without interruption, and if the ends of the piece be clean and without ſoil: Becauſe the ſaid veins ſhew if the Iron be without knots and puffs, and you may underſtand the middle by the ends. Being wrought into plates ſquare, or any other figure, if the ſides be even, you may conclude, 'tis all alike good, having equally endured the hammer.

With Lead they cover ſtately Palaces, Churches, Towers, and other publick buildings, and Gutters and Pipes to convey water, and therewith they faſten the Hinges and Iron-work in the Jaumes of Doors and Windows. There are three ſorts thereof, white, black, and of a colour between both, and by ſome called Aſh-colour; the black is ſo called, not becauſe tis really black, but becauſe being white, with ſome blackneſs in it: Therefore in reſpect of the white, the Ancients with reaſon gave it that name. The white is more perfect and precious then the black, the Aſh-colour is between both: Lead is digged either in great lumps found by themſelves, or in ſmall pieces, which ſhine with a certain blackneſs, or elſe in very thin flakes, amongſt the Rocks, Marble and Stones. All ſorts of Lead will eaſily run, becauſe with the heat of the fire it melts before it is red hot: But put it into a very hot furnace, it looſeth its nature and ſtrength; for one part is changed into Litharge, and the other into droſs. Of theſe ſorts of Lead the black is ſoft, and therefore eaſily wrought with the hammer, and dilates much, and is very heavy. The white is harder and lighter, the Aſh-colonr is much harder then the white, and of middle weight between both.

With Copper ſometimes they cover publick buildings; and the Ancients made Nails or Bolts, which faſtned in the ſtones above and below, kept the ſtones from falling out of order, and the Claſpes or Hooks placed to hold two ſtones together; and they uſed theſe Nails and Claſpes, becauſe that buildings which can't poſſibly be made without many pieces of ſtones may (by being thus joined and bound together) as it were become one ſtone, and ſo more ſtrong and durable. They alſo made Nails and Claſpes of Iron, but more often of Copper, becauſe they will laſt longer, not being ſo ſubject to ruſt. Alſo they made Letters for Inſcriptions, which they placed on the borders of buildings: And we read that of this Metal were the hundred famous gates of *Babylon*; and in the Iſles of *Cades*, the two Pillars of *Hercules* eight cubits high. That is eſteemed the beſt, which burnt and extracted from Mineral by fire, is red, inclining to yellow, *of a good grain, and full of holes*; for that is a ſign 'tis well purged, and free from droſs: Copper may be heated like Iron, and made liquid, ſo that it may be caſt; but in extream hot furnaces, it will not indure the force of the flame, but totally conſume. Although it be hard, nevertheleſs it ſubmits to the hammer, and dilates it ſelf into thin Leaves; it is beſt preſerved by Tarr: And although it doth not ruſt like Iron, yet it hath a kind of ruſt which is called *Verdegreece*, eſpecially if it touch ſharp and liquid things; of this metal mixed with Tin, or Lead, or Latten ( which is alſo Copper ) and coloured with *Lapis Calaminaris*, is made a metal commonly called Braſs; which oftentimes Architects do uſe, as in Baſes, Pillars, Capitels, Statues, and ſuch like. In *Rome* are four Columns of Braſs ( as St. *Giovanni Lateranno*) of which one only has its Capitel, and were made, by *Auguſtus*, of metal which was taken from the ſtems of Ships, which he took in *Egypt* from *M. Antonia*: There remains alſo in *Rome*, to this day, four ancient gates, which are thoſe of the *Rotunda*, which formerly was the *Pantheon*; that of St. *Adriano*, which was the Temple of *Saturnus*; that of St. *Coſmo* and *Damiano*, which was the Temple of *Caſtor* and *Pollux*, or rather of *Romulus* and *Remus*; and that which is in St. *Agnes*, without the gate *Viminalis*; but the moſt beautiful of all theſe, is that of St. *Maria Rotunda*, wherein thoſe Ancients did endeavour to imitate by Art that kind of *Corinthian* metal, in which the natural yellow of Gold prevailed: For we read that when *Corinth* was deſtroyed and burnt, ( which now is called *Coranto* ) thus they melted and mixed in one maſs, Gold, Silver, and Copper, and fortune tempered, and made the mixture of three ſorts, which afterwards was called *Corinthian*: In one of them the Silver prevailed, whence it remained white, and very near it in luſtre: In another the Gold prevailed, and remained yellow, and of a Gold colour: And the third was, where all theſe three metals were of an equal temperament; and theſe ſpecies have been ſince divers wayes imitated. Hitherto I have diſcourſed of thoſe things ſeeming moſt neceſſary to be conſidered and prepared before building; It now remains that ſomething be ſaid of foundations, the materials whereof being prepared, the work may be proceeded on.

# CHAP. VII.

## *Of the* Qualities *of Ground, wherein Foundations are to be laid.*

THE Baſe of the building is that which we call the Foundation, which is to ſay, the part which is under ground, upholding the reſt of the building that is above ground; therefore of all the errours which do happen in building, thoſe are the moſt pernicious which are committed in the foundation, becauſe they bring with them the ruine of the whole Fabrick, nor can without great difficulty be amended; whence the Architects ought to uſe their utmoſt diligence: Becauſe in ſome places they have a natural foundation, and in other places it is neceſſary to uſe Art.

A Natural Foundation is when we build on Stone, a ſoft ſandy or moldring Stone, or Gravel; for theſe, without digging, or other helps of Art, are of themſelves excellent foundations, and moſt fit to uphold the greateſt building both on Land and in Water: But if nature affords not a foundation, it muſt be attempted by Art, and then the place you have to build on, is either a *ſolid* Earth, or a gravelly, ſandy, moſſie, ſoft, and mooriſh place. If the Earth be faſt and firm, you may dig ſo far as to a diſcreet Architect may ſeem requiſite for the quality of the building, and ſoundneſs of the Earth: and (when you intend not to make Cellars, or other under-ground Offices) your depth is to be a ſixth part of the height of the building; to know this firmneſs, obſervation from the digging of Wells, Ciſterns, and ſuch like, will help well; and 'tis alſo known by Herbs growing there, if they uſually ſpring up only in firm and faſt grounds; and beſides, 'tis a ſign of firm ground, if, a great weight thrown thereon, it neither ſounds nor ſhakes; and from the report of Drums being ſet on the ground, and lightly touched, it does not reſound again, and if water put in a Veſſel doth not ſhake: The neighbouring places will alſo give you to underſtand the faſtneſs and firmneſs of the Earth: But if the place be ſandy or gravelly, obſerve whether it be on land or in water: For if it be on land, you muſt take notice what hath been before directed, concerning faſt ground; and if you build in a River, the Sand and Gravel is altogether uſeleſs, becauſe the water with its continual ſtream and flood often changes its bed: Therefore dig till you come to a bottom ſound and firm; or if that be difficult, dig ſomewhat in the Sand and Gravel, and then place piles whoſe ends may reach to the ſound and good Earth, and upon thoſe you are to build: But if you are to build upon a moſſie, and looſe ground, then you muſt dig till you find ſound Earth, and therein alſo ſo much as the bigneſs of the walls and the greatneſs of the building require.

This ſound ground ( and fit to uphold building ) is of divers ſorts; for ( as *Alberti* well ſaith ) ſomewhere ſo hard, as *'tis ſcarce to be cut with Iron*; ſomewhere very ſtiff, ſomewhere blackiſh, ſomewhere whitiſh (which is accounted the weakeſt) ſomewhere like chalk, ſomewhere ſandy; of all theſe the beſt is that which is cut with moſt labour, and when wet, doth not diſſolve into dirt.

You ſhould not build upon a ruine or old foundation, if firſt of all you know not its depth, and whether it be ſufficient to bear the building; but if the Earth be ſoft and ſink much, as in mooriſh grounds, then you muſt place piles, whoſe length muſt be an eighth part of the height of the Wall, and in thickneſs a twelfth part of their length: The piles muſt be placed as cloſe as one can ſtand by the other, and are to be rammed in with blows, rather quick then heavy, ſo that the Earth may the better conſolidate and faſten. You muſt place the piles not only under the out-walls, upon the Trench or Gutters, but alſo under the inner-walls, which divide the Building: For if you make the foundation for the inner-walls different from thoſe without, then laying Beams along one by the other, and others athwart them above, oftentimes it happens, that the inner-walls fall down, when thoſe without being placed on piles, ſtir not: Whence all walls come to cleave, the which render the building ruinous, and is very uncomely to look on; wherefore you muſt avoid this danger, making the piling work of leſs charge ; for according to proportion of walls, the piles in the middle may be placed thinner then them without.

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# CHAP. VIII.

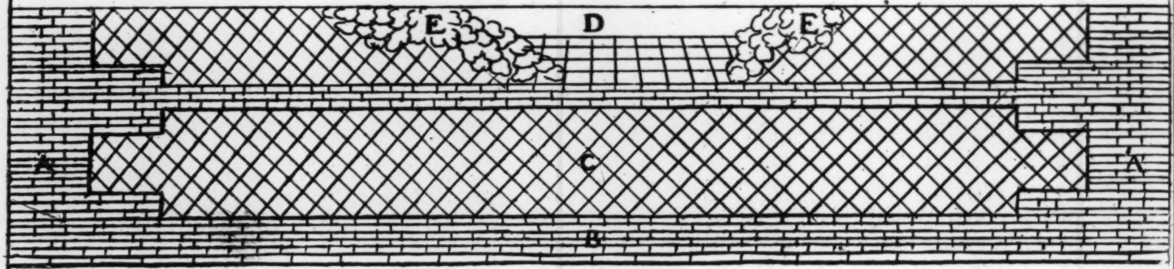
## *Of Foundations.*

FOundations ought to by twice ſo thick as the walls to be raiſed thereon, and therein the quality of the Earth, and the greatneſs of the building is to be regarded, making them more large in ſoft and looſer ground, and where there is a great weight to be ſuſtained. *The plain of the Trench* muſt be Level, ſo that the weight may preſs equally, and not inclining to one part more then another, may prevent the cleaving of the walls. For this reaſon the Ancients uſed to pave the plain with *Tivertine*, and we lay Planks and Beams, and build thereon.

*Tivertine*, a certain ſtone brought from *Trivoli.*

Foundations are made ſloping, that is to ſay, to diminiſh as they riſe; yet ſo, as that there may be ſo much left on one ſide, as on the other: So that the middle of that above may fall perpendicularly upon the middle of the lower work, which muſt be alſo obſerved in the diminution of Walls above ground; becauſe by this means the building becomes much ſtronger, then by making the diminutions any other way.

There is ſometimes made ( eſpecially in mooriſh grounds where there is need of piles ) to avoid charge, Foundations diſcontinued but with certain Vaults, upon which they afterwards build. In great buildings 'tis very commendable to make vents through the body of the Walls, from the Foundation to the Roof, becauſe they let forth the wind (which is very prejudicial to buildings) leſſen the charge, and are of no ſmall convenience, if in them you make winding ſtairs from the bottom to the top,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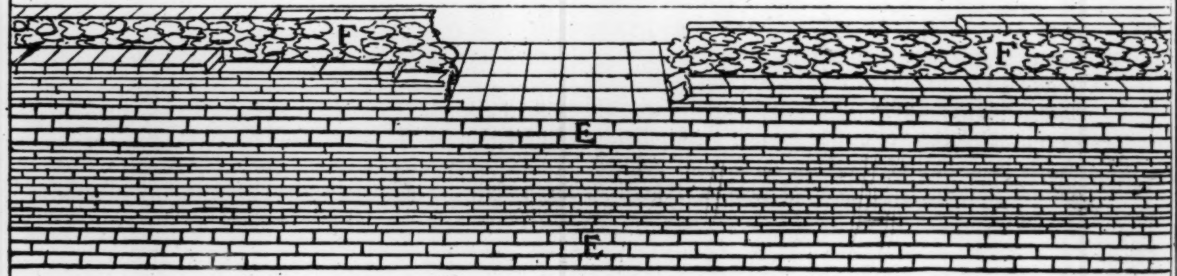
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# CHAP. IX.

## *Of the Faſhion of Walls.*

THE Foundation being laid, it remains that we treat of the Superſtructure. The Ancients had ſix ſorts of Walls; one called *Reticolata*, or *Net-work*: Another of *Quadrels*, or *Brick*: A third of *Cement*, which is of rough ſtones from the Hills or Rivers: A fourth of various ſtones: a fifth of ſquared ſtones: The ſixth *Riempiuta*, which is alſo called Coffer-work. Of the Net-work there is no uſe at all in theſe days; but becauſe *Vitruvius* relates it was common in his time, I do here put alſo that deſign. They made the Coignes and Corners of their building of *Quadrels*, and every two foot and half took up three *Courſes* of *Quadrels*, which bound the whole thickneſs of the Wall.

A. *Coignes, or Corners of Quadrels.*
B. *Courſes of Quadrels, which bind the whole Wall.*
C. *The Net-work.*
D. *The Courſes of Quadrels, through the thickneſs of the Wall.*
E. *The inner part of the Wall made of Cement.*

Walls of *Brick*, or *Quadrels*, both thoſe about Cities, and other great Edifices, muſt be ſo made, that the inſide and outſide may be of *Quadrels*, and in the middle filled up with Cement, and with Brick, Earth, and Stone, rammed together; and to every three foot in height, there muſt be three Courſes of Quadrels of the biggeſt ſort, which may take the whole breadth of the Wall. And the firſt Courſe muſt be laid with the length inward, that the leſſer part of the Brick be expoſed: The ſecond, the length laid ſide-ways, and the third as the firſt. Of this ſort are the Walls of the *Rotunda* in *Rome*, and the Bathes of *Dioclesian*, and all other ancient buildings which are there.

E. *The Courſes of Quadrels, which bind the whole Wall.*
F. *The middle part of the wall made of Cement, between one Courſe and the other, and the outward Quadrels.*

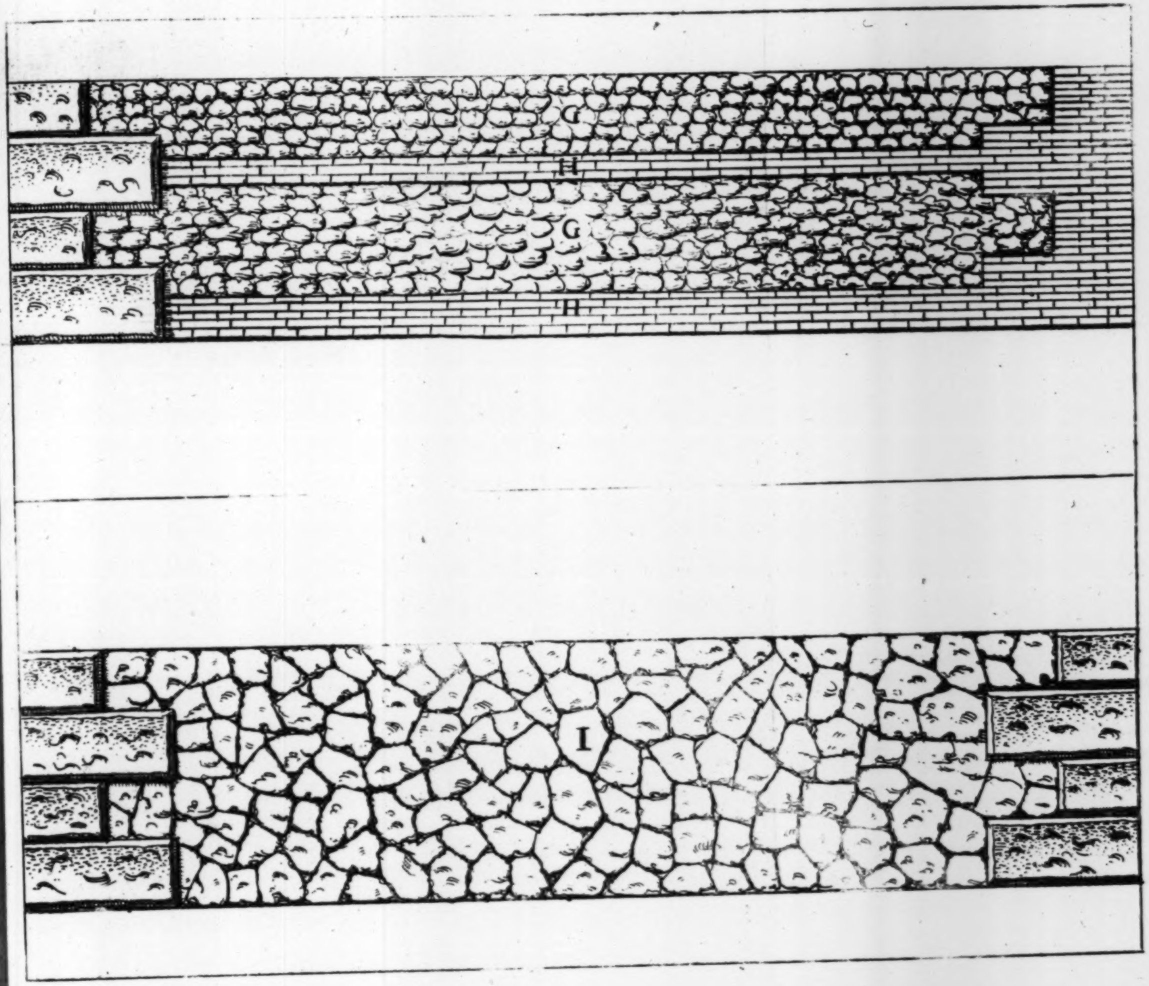
The Walls of *Cement* muſt be made ſo, that to every two foot at leaſt, there be three Courſes of *Quadrels* or *Brick*; and that the *Quadrels* or *Brick*, be prepared according to the manner aforeſaid. Such are the Walls of *Turin* in *Piedmont*, which are made of River pebbles ſplit in the middle, which being placed with the ſplit ſide outwards, make very even and ſmooth work. The Walls of the *Arena* of *Verona* are likewiſe of *Cement*; and there are three Courſes of *Quadrels* to every three foot: And in like manner are made other ancient Edifices, as appears in my Books of Antiquities.

G. *Cement or River Pebbles.*
H. *Courſes of Quadrels which bind the whole Wall.*

The Walls of *irregular ſtones* were ſo called, becauſe they were made of Stones of unequal ſides and Angles; and to make theſe Walls, they uſed a plumb Rule, which applied to the place where the Stone was to be put, ſerved to place them ſtraight and even: Thereby to try, time after time, if the Stone ſtood right in the deſigned place. Of this ſort may be ſeen Walls at *Preneſte*, and Ancient ſtreets were paved in this manner.

I. *Irregular Stones.*

At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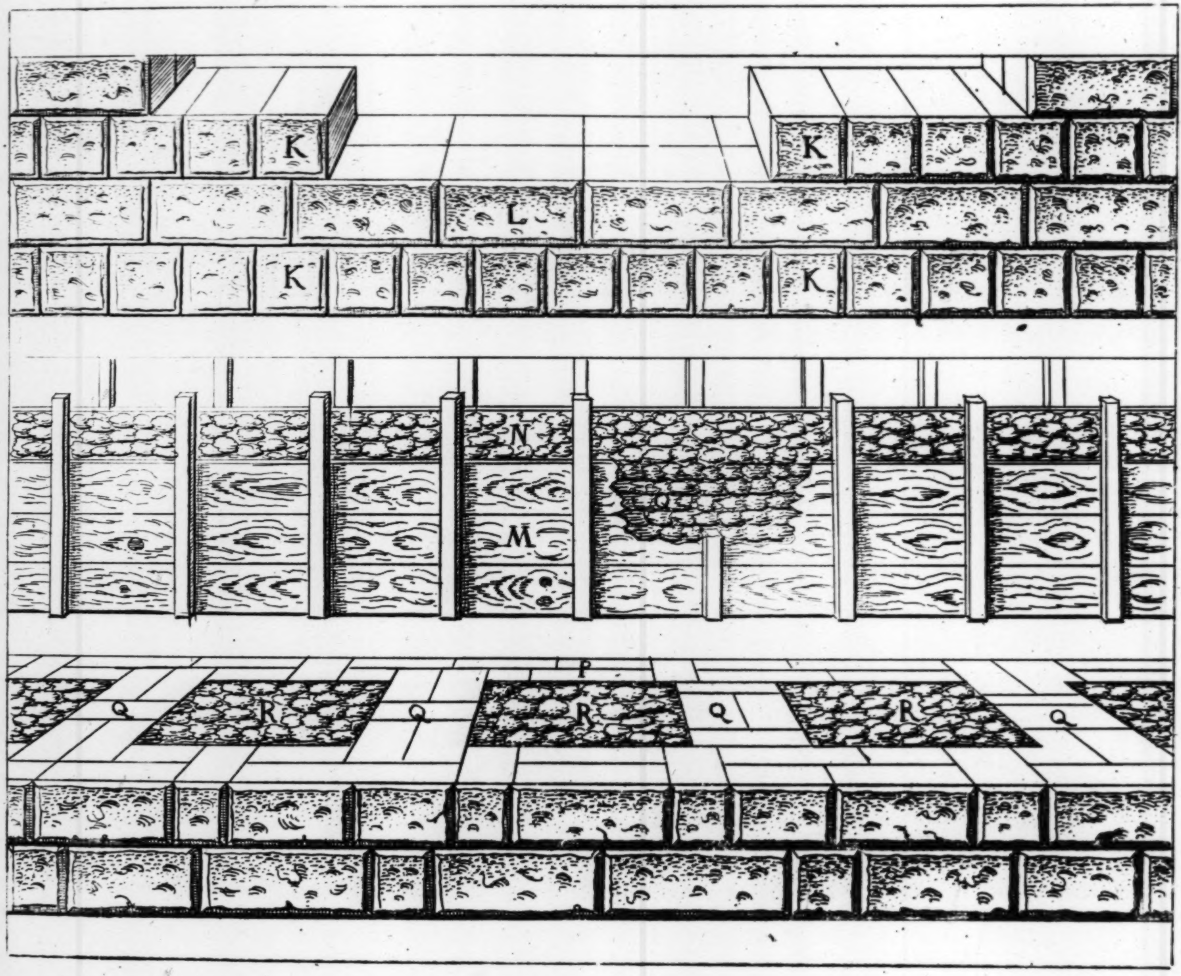
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At *Rome* may be ſeen Walls of ſquared Stones, where was the *Piazza*, and the Temple of *Auguſtus*, in which they locked in the leſſer Stones with Courſes of greater.

K. *Courſes of leſſer Stones.*
L. *Courſes of bigger Stones.*

The manner *Riempinta*, or filled Walls, which is alſo called Coffer-work, which the Ancients did uſe; taking Planks, and placing them edg-wiſe, allowing ſo much ſpace as they would have the thickneſs of the Wall, filling it with mortar, and ſtones of all ſorts mingled together; and ſo they went on from Courſe to Courſe. There is ſeen ſuch like Walls at *Sermion*, upon the Lake *De Grada*.

M. *Planks put edge-wiſe.*
N. *The inner part of the wall.*
O. *The face of the Wall, the Planks taken away.*

Of this kind may be called the ancient walls of *Naples*, which had two walls of ſquared Stones four foot thick, and ſix foot diſtant th' one from the other; thoſe walls were bound together, with other croſs walls, and the *Caſes* which were between the Traverſe walls and the Out walls were four foot ſquare, and were filled up with Stones and Earth.

P. *The Outward Stone Wall.*
Q. *The Traverſe Walls.*
R. *Caſes filled with Stones and Earth.*

Theſe were the formes of which the Ancients did ſerve themſelves, and the foot ſteps thereof are yet to be ſeen; whence it may be concluded, that walls of what ſort ſoever ought to have ſome Tires or Courſes, which are like ſinews that hold faſt

faſt all other parts together, which chiefly may be obſerved when Walls are made of Brick: For the ſtructure through age falling aſunder in the middle, the Walls may not become ruinous, as hath hapned, and is ſeen in many Walls, eſpecially on that ſide which reſpects the North.

## CHAP. X.

### *Of the Method which the Ancients did practiſe in making their Stone Buildings.*

BEcauſe it happens, that ſometimes buildings are made (the whole, or good part) of Marble, or ſome other great ſtones; I think it convenient, in this place, to acquaint you what the Ancients did in ſuch caſes; for we may obſerve, in their work, that they were ſo diligent in joining their ſtones together, that in many places their connexion can ſcarcely be perceived. And beſides, the Beauty, Firmneſs, and Duration of the Fabrick is very much to be regarded.

And for as much as I can underſtand, they firſt ſquared and wrought the ſides of the ſtones which were to be placed one upon the other, leaving the other ſides rough, and ſo uſed them; whereupon the edges of the ſtones were beyond the ſquare, and might manage them better, and more variouſly attempt to place them right without danger of breaking, then if they had been ſquared on all ſides before; for when the edges are made ſquare, or leſs then ſquare, they are very weak and ſubject to accidents: In this manner they made all buildings rough, or, as one may ſay, ruſtick; and that being done, they go on working and poliſhing the face of the ſtone which is to be ſeen. It is true that the Roſes which are between the *Madilions*, and other ſuch like ornaments of the Cornich, could not commodiouſly be done when the ſtones were fixed, therefore they made them while they were on the ground. This is well atteſted by many ancient buildings, where may be ſeen many ſtones rough and unpoliſhed. The Arch by the old Caſtle in *Verona*, and all other the Arches and buildings there, were done in the ſame manner; which is eaſily made out by one curious in obſerving the marks of their Tools, that is to ſay, the manner how the ſtones were wrought. The pillars of *Trajan*, and *Antonine* in *Rome*, were ſo made, nor could they otherwiſe have ſo exactly joined the ſtones, that might ſo cloſely meet where they go croſs the heads, and other part of the figures. And the ſame may be ſaid of the other Arches which are there.

And if the works were very great, as the *Arena* of *Verona*, the Amphitheatre of *Pola*, and the like, to ſave charge and time, which they would have required, they wrought only the Impoſts of the Arches, Capitels, and the Corniches; and the reſt they left Ruſtick, having only regard to the fair front of the building. But in Temples, and other buildings, which required curioſity, they ſpared no pains in the working them, and glazing and ſmoothing even the very fluces of the Columns, and poliſhing them diligently. Therefore, in my judgment, you ſhould not make Walls of Brick in the Ruſtick manner, much leſs Mantles of Chimnies, which require curious work; for beſides the unhandſomneſs, 'twill happen that they will ſplit and divide aſunder, which naturally ought to be intire; but according to the greatneſs and quality of the building, you may make them Ruſtick or Polite: And in a work that requires altogether neatneſs, we need not do as the Ancients uſed, with Reaſon, and neceſſitated by the greatneſs of their works.

## CHAP. XI.

## *Of the Diminution of Walls, and of their parts.*

IT is to be obſerved, that by how much the higher the Walls are, ſo much the narrower they muſt be; therefore that part which is above ground is to be one half thinner then the foundation, and the ſecond ſtory a half brick thinner then the firſt; and ſo continue till you come to the top of the building, but with diſcretion, that it be not too weak. The middle of the upper Wall ought to fall direct to the middle of the lower, that ſo all the Walls be in a Pyramidal form. But if you would make a ſuperficies, or face of a Wall, above, directly over that below, it muſt be on the inner part; becauſe the raſtings of the Floors, the Vaults, and other ſupporters of the building, may not ſuffer the Wall to fall or give way. The diſcharged part, which is on the outſide, muſt be ſupplyed with a Border or Corniche, incompaſſing the whole building, which will be an ornament and faſtning to the whole Fabrick.

The Angles, becauſe they partake of both ſides, and are to keep them upright and faſt together, muſt be very ſtrong, and held with long and hard ſtones, as it were with arms; therefore the Windows and Apertures muſt be as far from them as may be; or at leaſt, ſo much ſpace muſt be left between the Aperture and the Angle, as is the breadth of the Aperture.

Having ſpoken of meer Walls, 'tis convenient to paſs to the ornaments, the greateſt whereof are the Columns when they are meetly placed, and have fair proportion to the whole Fabrick.

CHAP.

## CHAP. XII.

## *Of the five Orders uſed by the Ancients.*

FIve were the Orders among the Ancients, that is to ſay, the *Tuſcan, Dorick, Ionick, Corinthian*, and *Compoſita*, which ought to be ſo diſpoſed in the building, that the ſtrongeſt be ſet loweſt; for then 'twill be more capable to bear the weight, and the building will have a more ſure foundation: Wherefore they alwayes place the *Dorick* under the *Ionick*, the *Ionick* under the *Corinthian*, and the *Corinthian* under the *Compoſita*; the *Tuſcan*, as being rude, ſeldome is uſed above ground, unleſs in a building of one Order onely, as in Town-houſes, or in vaſt buildings, as Amphitheaters and ſuch like, where being many Orders, this inſtead of the *Dorick* is placed under the *Ionick*; and if you leave out one of them, and place, for example, the *Corinthian* immediately over the *Dorick*, which may be done according to the Rule aforeſaid, provided alwayes, that the more ſolid be the loweſt. I ſhall ſet down, particularly, the meaſure of each of theſe Orders; not ſo much according to the Doctrine of *Vitruvius*, as according to my own obſervations in Ancient buildings; but firſt I will ſay thoſe things which belong to all in general.

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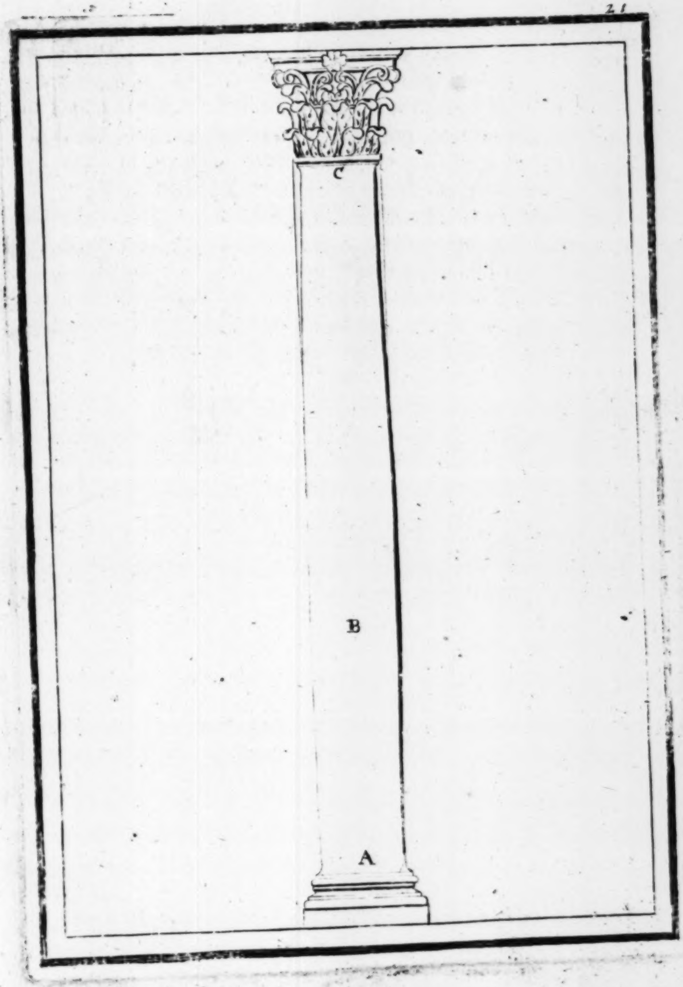
## CHAP. XIII.

## *Of the ſwelling of Columns, and their diminutions; of Inter-columns and Pillaſters.*

COlumns of every Order muſt be ſo formed, that the upper part muſt be leſſer then the lower, and the middle ſomewhat thick; in diminiſhing it muſt be obſerved, that by how much longer the Columns are, ſo much the leſs muſt they be diminiſhed, in regard that the height of it ſelf works the effect of diminiſhing by the diſtance; therefore if the Column be 15. foot high, the Diametre of the Column below muſt be divided into $6\frac{1}{2}$. parts, and the Diametre thereof above ſhall be $5\frac{1}{2}$. of thoſe parts. If from 15. to 20. the Diametre below muſt be divided into ſeven parts, and $6\frac{1}{2}$. muſt be the thickneſs of the upper part; ſo likewiſe thoſe which are from twenty to thirty the Diametre below muſt be divided into 8. parts, and 7. muſt be the Diametre of the upper part, and ſo the Columns which are higher are to be diminiſhed proportionably by their ſeveral parts, as *Vitruvius* ſhews in his Second Chapter of this Third Book. But now the ſwelling is to be made in the middle, we have no more to ſhew from him then a bare promiſe; and therefore many have written variouſly thereof. I am wont to make the profile of the ſaid ſwelling in this manner; I divide the body of the Column into three equal parts, and leave the lower third part perpendicular, at the end of which I lay a long thin rule as long as the Column, or a little more, and move that part which reacheth from the third part upwards, and bend it till the end touch at the point of the diminution, at the top of the Column under the *Collarino* or *Aſtragal*; according to that bending I proceed, and ſo the Column becomes ſomewhat ſwelled in the middle, and appears very handſome; and although I could not have contrived (beſide this) a form either ſhorter or more expedient, or that might be more acceptable; I am yet more confirmed in this my opinion, ſince it hath ſo much pleaſed *Pr. Cattaneo* that (I having told him of it) he hath put it into one of his Works of Architecture, with which he hath not a little Illuſtrated this profeſſion.

A. B. *The third part of the Column which is perpendicular.*
B. C. *The two thirds diminiſhed.*
C. *The point of the Diminution under the Collarino or Aſtragal.*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The Inter-Columns, that is to ſay, the ſpaces between the Columns, may be made of a Diametre, and $\frac{1}{2}$. of the Column, and the Diametre is to be taken at the lower part of the Column, of two Diametres, of two and $\frac{1}{4}$. of three, and ſometimes of more. But the Ancients were not wont to allow more then three Diametres of the Column, except in the *Tuſcan* Order, in which the Architrave is wont to be of wood; they made the Inter-columns very large, not leſs then a Diametre and half, and this ſpace they allowed ſometimes, eſpecially when they made the Columns very big; but thoſe Inter-columns were moſt preferred that were of two Diametres, and $\frac{1}{4}$. of the Column; and they accounted this the moſt noble and beautiful manner of the Inter-columns.

And you ought to take notice, that between the Inter-columns and the Columns, there ought to be proportion and correſpondence, for leaving too much vacancy between ſmall Columns, you will take away great part of their beauty; becauſe the great quantity of air that will be between them will diminiſh very much their thickneſs; and on the contrary, leaving too little ſpace to the great Columns, by the ſtreightneſs and narrowneſs of the ſpaces they will appear gouty, and very ungraceful: Therefore if the ſpaces exceed three Diametres, you muſt make the Columns in thickneſs a ſeventh part. of their height, as I obſerve hereafter in the *Tuſcan* Order; but if the ſpaces ſhall be three Diametres, the length of the Column muſt be $7\frac{1}{2}$. or eight, as in the *Dorick* Order; and if $2\frac{1}{4}$. the length of the Column muſt be 9. Diametres, as in the *Ionick*; if 2. the length of the Column muſt be $9^{1}$. as in the *Corinthian*. Laſtly, if $1\frac{1}{2}$. the length of the Column muſt be 10. as in the *Compoſita*. Concerning theſe Orders, I have took this care, that they may be examples for all other Inter-columns, which *Vitruvius* intimates in the Chapter aforeſaid.

In the front of buildings, the Columns ought to be an even number, ſo that the middle Inter-column may be made bigger then the reſt, that the Doors and Entries may be the better ſeen; which uſually are placed in the middle: And thus much for Pillar-work only.

But if Galleries be made with Pillaſters, they muſt be ſo diſpoſed, that the Pillaſters be not leſs then a third of the vacancy between Pillaſter and Pillaſter, and thoſe at the corners muſt be two thirds bigger then the other, that ſo the Angles of the Fabrick may be firm and ſtrong; and when they are to ſupport an extraordinary great weight, as in very great buildings, then they muſt be the half of the vacancy: As thoſe of the Theatre of *Vicenza*, and the Amphitheatre at *Capua*: Or elſe two thirds, as thoſe of the Theatre of *Marcellus* in *Rome*, and of the Theatre of *Ogubas*, which now belongs to *Sig. Lodovico de Gabrielli*, a Gentleman of that City. The Ancients alſo made them ſometimes as large as the whole vacant, as in the Theatre of *Verona*, in that part which is not upon the Hill. But in private buildings, they are not to be made leſs then a third of the vacant, nor larger then two thirds, and they ought to be ſquare; but to ſave charge, and to make room to walk more freely, they may be made leſs in the flank then in the front.

And to adorn the frontiſpiece, you may put in the middle of the front half Columns, or other Pillaſters which may bear up the Corniche, which ſhall be upon the Arches of the Gallery; and they muſt be as large as their height ſhall require, according to their ſeveral orders, as in the enſuing Chapters and deſignes may appear; for underſtanding whereof (that I may not repeat the ſame thing often) you may underſtand, that I in the dividing and meaſuring the ſaid Orders, would not take a certain and determinate meaſure, which is peculiar to any City, as Cubit, Foot or Span; well knowing, that meaſures are as various as the Cities and Countries. But in imitation of *Vitruvius*, who divides the *Dorick* Order with a Meaſure taken from the thickneſs of the Column, which is common to all, and by him called a *Module*: I will alſo ſerve my ſelf with ſuch a Meaſure in all the Orders, and the *Module* ſhall be the Diametre of the Column, taken at the Baſe, divided into 60. parts; except in the *Dorick*, in which the *Module* is to be the half Diametre of the Column, and is divided into 30. parts: For ſo it falls more commodious in the Compartiments of the ſaid Order. Wherefore every one may ſerve himſelf (making the *Module* greater or leſſer, according to the quality of the Fabrick) with the proportions and profiles deſigned convenient to every Order.

CHAP.

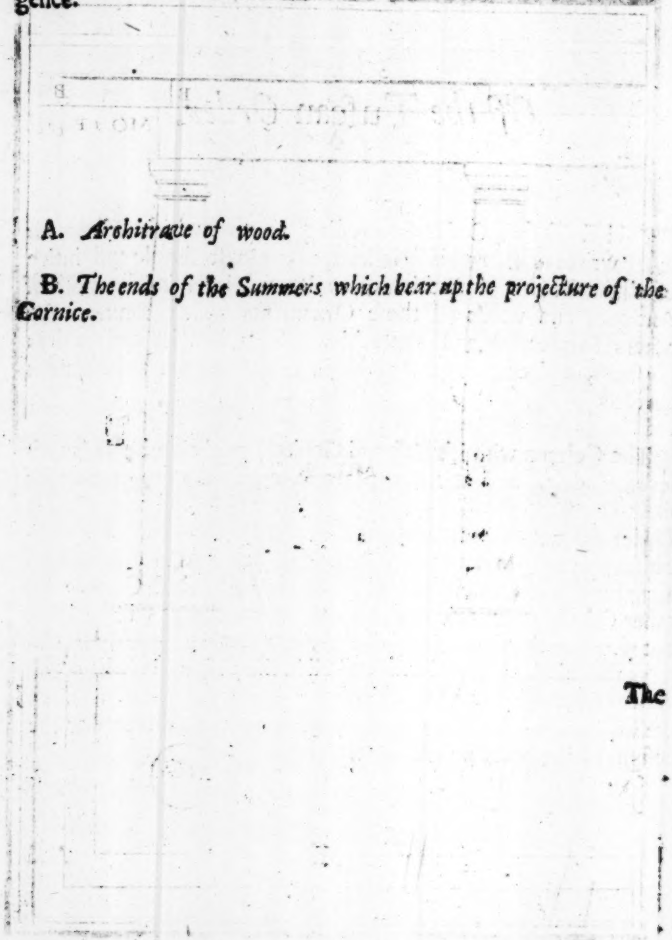
# CHAP. XIV.

## *Of the* Tuſcan *Order.*

THE *Tuſcan* Order, according to that which *Vitruvius* writes of it, and is ſo indeed, is the moſt ſimple and intire of all the Orders of Architecture: Becauſe it retains the moſt of Antique, and wants all thoſe Ornaments which renders the others ſo pleaſant and agreeable. This had its Original in *Tuſcana*, a place very remarkable in *Italy*, whence the Name is derived.

The Column with it's Baſe and Capitel, ought to be in length ſeven Models, and at the top are diminiſhed a fourth part of their Diametre, having occaſion of a row of Columns of this Order only, you may make the Inter-columnes very large; becauſe the Architraves may be of wood, and will be very convenient for Country uſe, for the paſſage in and out of Carts, and other Country conveniences; and beſides the charge will be leſs; but if you make Gates or Galleries with Arches, you muſt obſerve the meaſures that I have marked in the deſign, in which you may obſerve the Stones ſo diſpoſed or joyned together, as when the whole work is of Stone; the which I have alſo directed in the deſigns of the other four Orders.

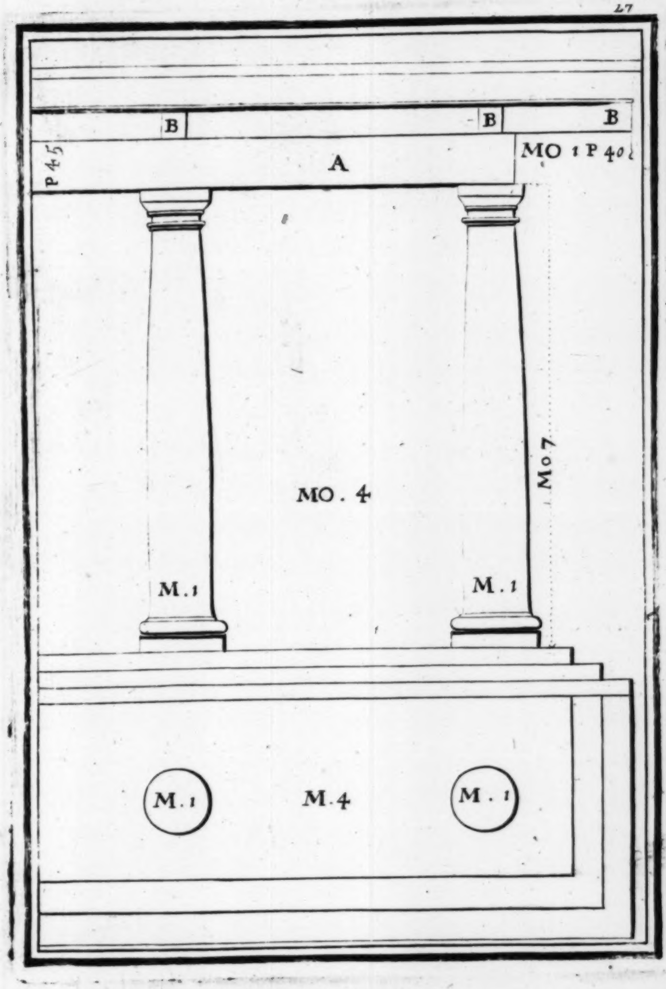
And this way of diſpoſing and faſtning the Stones, I have derived from many Ancient Arches, as appears in my Books of Arches; and herein I have uſed great diligence.

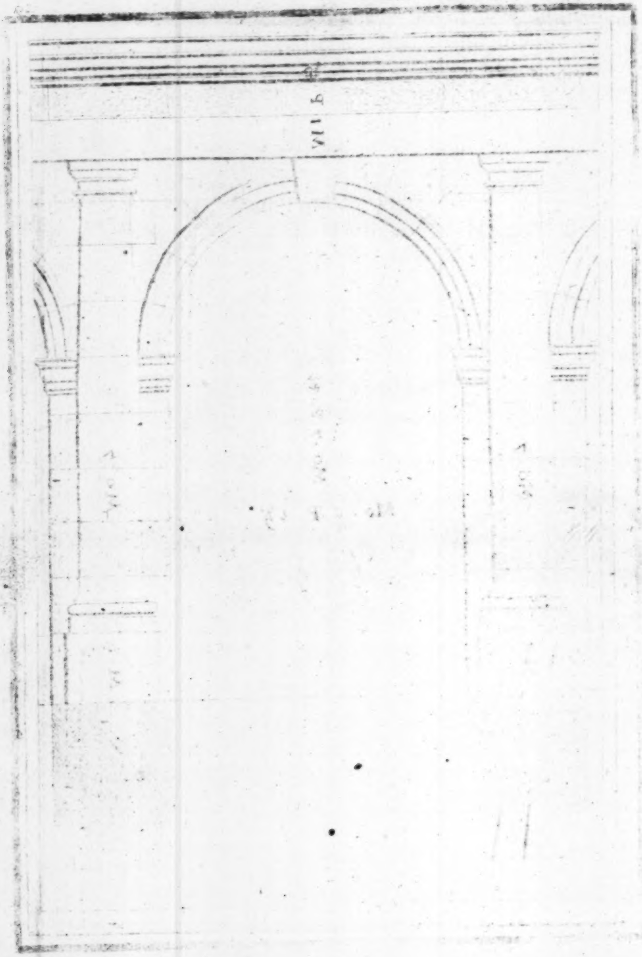


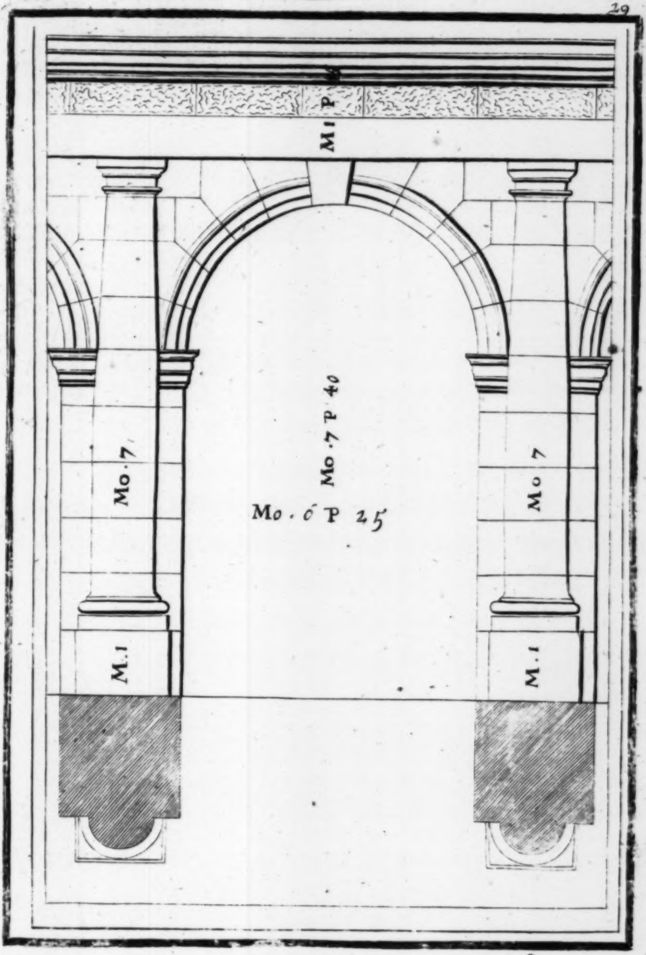
A. *Architrave of wood.*

B. *The ends of the Summers which bear up the projecture of the Cornice.*

The


B
B
B
A
P 45
MO 1 P 40
MO . 4
Mo 7
M . 1
M . 1
M . 1
M . 4
M . 1


Pl. VII


M1 P
Mo.7
Mo.7 P 40
Mo.6 P 25
Mo 7
M.1
M.1

The *Pedeſtals* which are made under the Columns of this Order muſt be the height of one Model, aad made plain. The height of the Baſe is to be the half Diametre of the Column. This height muſt be divided into two equal parts; one is given to the *Orlo* or *Plinth*, which muſt be made round; the other is divided into four parts; one for the *Liſtella*, or *Cincture*, which may be made a little leſs, and is alſo called *Cimbia*; and in this Order only is part of the Column, the other three are for the *Totus*. The *Projecture* of this Baſe is a ſixth part of the Diametre of the Column below. The *Capitel* is the height of half the Diametre of the Column below, and is divided into three equal parts. One is given to the *Abacus*, which from its form is commonly called *Dado*, or *Dye*. The other to the *Ouolo*, or *Echinus*, and the third is divided into ſeven parts, of one is made the *Liſtella* under the *Ouolo*, and the other ſix remain to the *Collorino*, or neck of the Column. The *Aſtragal* is double, the height of the *Liſtella* under the *Ouolo*, and the Centre thereof, is made upon the line, which falls pſum upon the ſaid *Liſtella*, and upon the ſame line doth fall the projecture of the *Cimbia*, which is as thick as the *Liſtella*. The *Projecture* of the *Capitel* anſwers to the body of the Column below; its Architrave is made of Wood as high as broad; and the breadth ought not to exceed the body of the Column at the top. The *Summers* which carry on the *Eaves*, projecteth a fourth part of the length of the Column, Theſe are the meaſures of the *Tuſcan* Order, as *Vitruvius* teacheth.

The *Pedeſtals* which are made under the Columns of this Order muſt be the height of one Model, and made plain. The height of the Baſe is to be the half Diametre of the Column. This height muſt be divided into two equal parts; one is given to the *Orlo* or *Plinth*, which muſt be made round; the other is divided into four parts; one for the *Liſtella*, or *Cincture*, which may be made a little leſs, and is alſo called *Cimbia*; and in this Order only is part of the Column, the other three are for the *Torus*. The *Projecture* of this Baſe is a ſixth part of the Diametre of the Column below. The *Capitel* is the height of half the Diametre of the Column below, and is divided into three equal parts. One is given to the *Abacus*, which from its form is commonly called *Dado*, or *Dye*. The other to the *Ouolo*, or *Echinus*, and the third is divided into ſeven parts, of one is made the *Liſtella* under the *Ouolo*, and the other ſix remain to the *Collorino*, or neck of the Column. The *Aſtragal* is double, the height of the *Liſtella* under the *Ouolo*, and the Centre thereof, is made upon the line, which falls pſum upon the ſaid *Liſtella*, and upon the ſame line doth fall the projecture of the *Cimbia*, which is as thick as the *Liſtella*. The *Projecture* of the *Capitel* anſwers to the body of the Column below; its Architrave is made of Wood as high as broad; and the breadth ought not to exceed the body of the Column at the top. The *Summers* which carry on the *Eaves*, projecteth a fourth part of the length of the Column, Theſe are the meaſures of the *Tuſcan* Order, as *Vitruvius* teacheth.

A. *Abacus.*

B. *Echinus.*

C. *Hypotrachelium, or frize of the Capitel.*

D. *Aſtragal.*

E. *Body of the Column above.*

F. *Body of the Column below.*

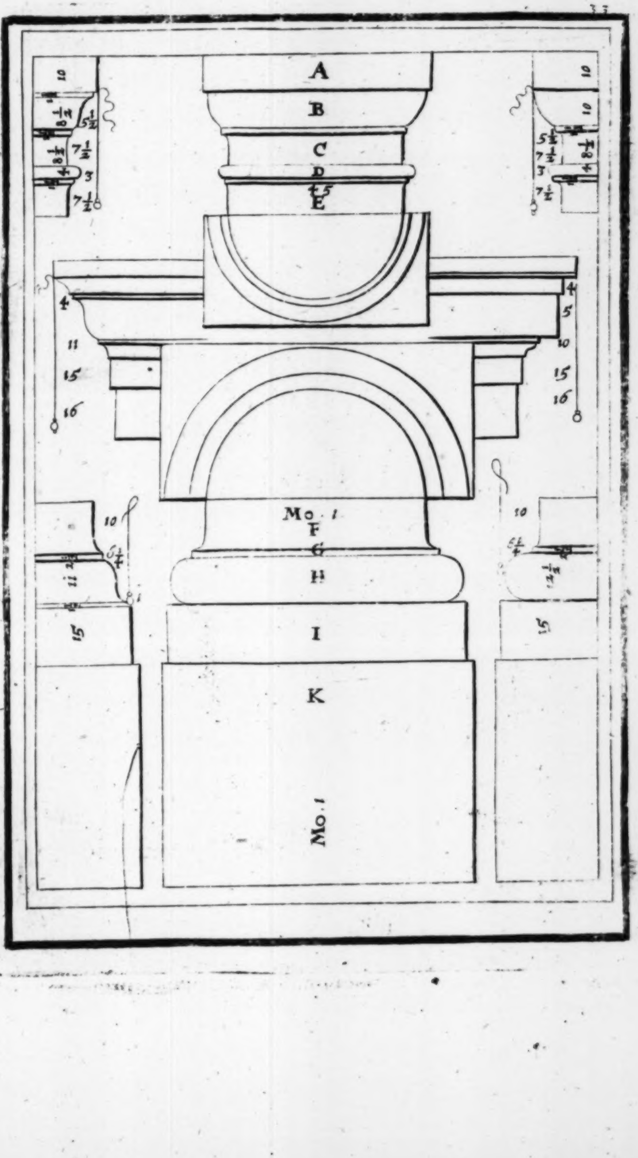
G. *Annulet Ceincture, or Liſtella.*

H. *Torcus.*

I. *Orlo, or Plinth.*

K. *Pedeſtal, or Stylobatum.*

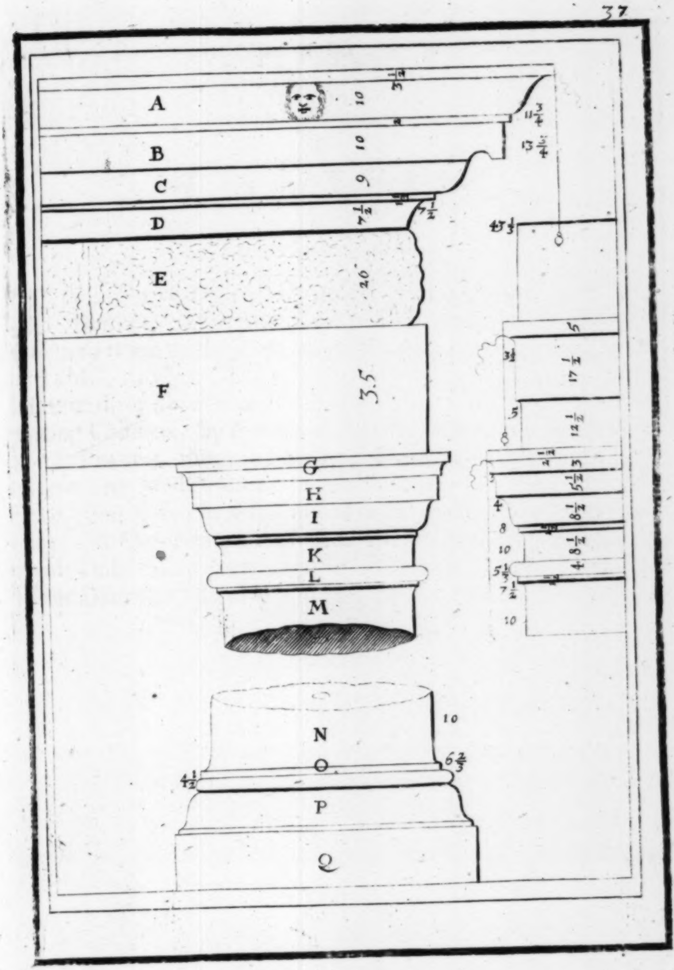
The *Profiles* which are placed by the plain of the Baſe and *Capitel*, are the Impoſts of the Arches.


A
B
C
D
E
4 5
10
$8\frac{1}{2}$
$5\frac{1}{2}$
$8\frac{1}{2}$
$7\frac{1}{2}$
4
3
$7\frac{1}{2}$
10
10
$5\frac{1}{2}$
$8\frac{1}{2}$
$7\frac{1}{2}$
4
3
$7\frac{1}{2}$
4
11
15
16
4
5
10
15
16
Mo. 1
F
G
H
I
K
Mo. 1
10
$6\frac{1}{4}$
11
15
10
$6\frac{1}{4}$
11
15

But if they make the Architraves of ſtone, it muſt be obſerved, which was ſpoken before of the Inter-columns; there is to be ſeen ſome Ancient Buildings, which may be ſaid to be built according to this Order, becauſe they retain in part the ſame Meaſures, as in the *Arena* of *Verona*, and Theatre of *Pola,* and many others; of which I have undertaken the profiles, not only of the Baſe of the Capitel of the Architrave of the *Freze* and of the *Cornice*, put down in the laſt page of this Chapter. But alſo thoſe of the Imports of Arches; and of all theſe buildings, I ſhall put the deſigns in my Books of Antiquities.

A. *Scima Recta.*
B. *Corona.*
C. *The projecture of the Corona, and the Scima Recta.*
D. *Cavetto.*
E. *Freze.*
F. *Archetrave.*
G. *Cimatium.*
H. *Abacus.*
I. *Scima Recta,*
K. *Hypotrachelium, or frize of the* Capitel.
L. *Aſtragolus.*
M. *Body of the Column under the Capitel.*
N. *Body of the Column below.*
O. *Annulet, or Cincture.*
P. *Torus, or Scima Reverſa.*
Q. *Orlo, or Plinth of the Baſe.*

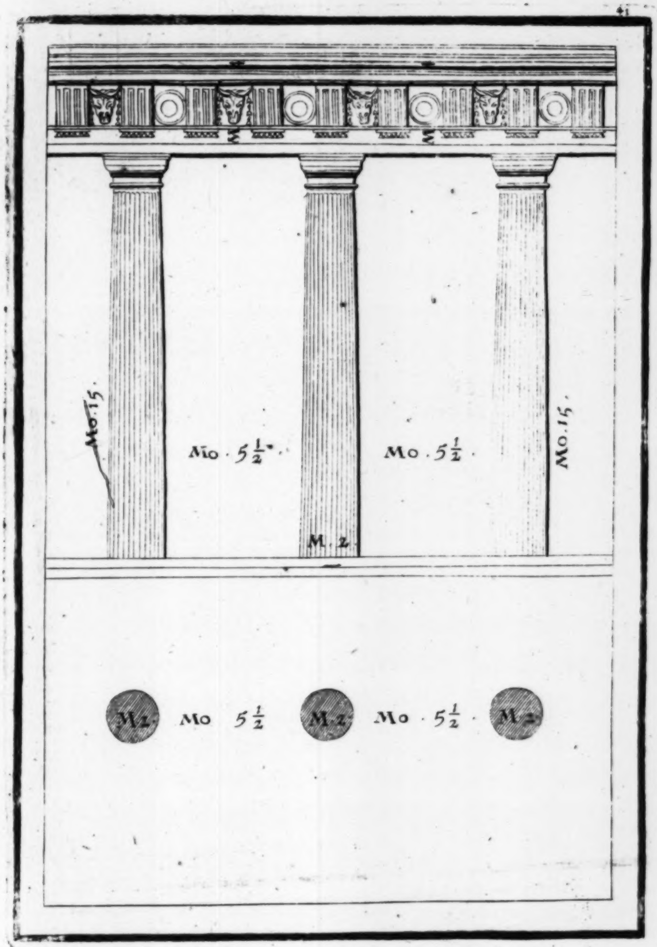
Over againſt the *Archetrave* marked *F.* is the profile or deſign of an *Archetrave* very curiouſly wrought.

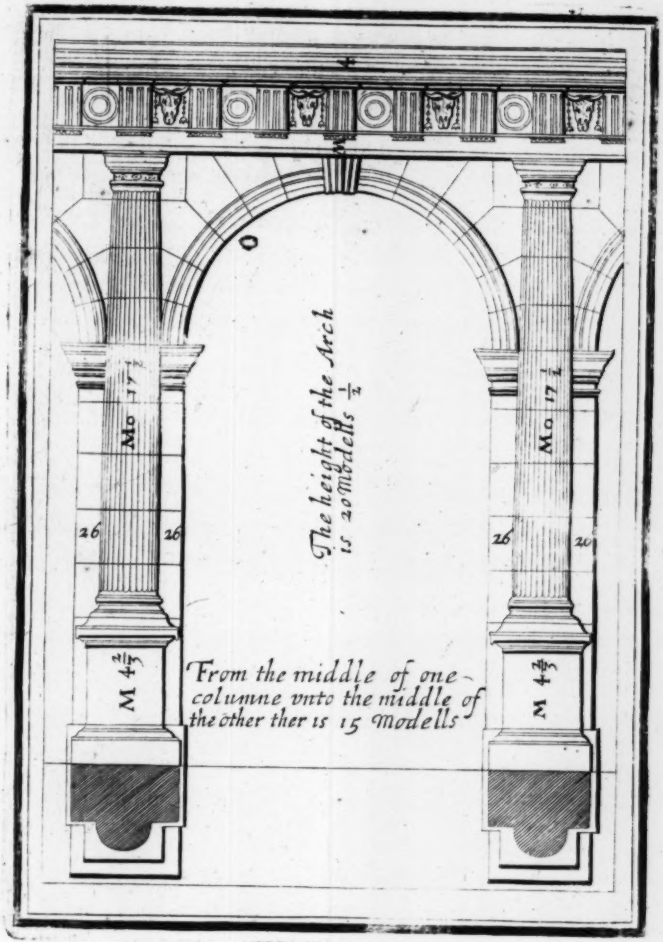

A
10
$3\frac{1}{2}$
$11\frac{3}{4}$
B
10
$13\frac{1}{4}$
C
9
D
$7\frac{1}{2}$
$7\frac{1}{2}$
E
20
F
35
$43\frac{1}{3}$
5
$3\frac{1}{2}$
$17\frac{1}{2}$
5
$12\frac{1}{2}$
$2\frac{1}{2}$
3
$5\frac{1}{2}$
4
$8\frac{1}{2}$
8
10
$8\frac{1}{2}$
4
$5\frac{1}{3}$
$7\frac{1}{2}$
10
G
H
I
K
L
M
N
10
O
$6\frac{2}{3}$
$4\frac{1}{2}$
P
Q

# CHAP. XV.

## *Of the* Dorick *Order.*

THE *Dorick* Order had its Original and name from the *Dorians*, a Grecian people which dwelt in *Aſia*; the Columns when made alone without Pilaſters, ought to be ſeven and a half, or eight Diametres long; the Inter-columns are little leſs than three Diametres of the Columns. And this manner of placing Columns, by *Vitruvius*, is called *Dyaſtylos*; but if they join to Pilaſters, they muſt be together with the Baſe and Capitel ſeventeen Models, and one third in length; and you muſt obſerve, that ( as I have ſaid before in the 13. Chapter ) the Model in this Order only is the half of the Diametre of the Column, divided into thirty parts; and in all the other Orders, it is the whole Diametre, divided into ſixty parts.


Mo. 15.
Mo · 5 $\frac{1}{2}$ ·
Mo · 5 $\frac{1}{2}$ ·
Mo. 15.
M. 2
M2.
Mo 5 $\frac{1}{2}$
M2.
Mo · 5 $\frac{1}{2}$ ·
M2.


4
3
O
Mo 17 1/2
Mo 17 1/2
The height of the Arch is 20 Modells 1/2
26
26
26
20
M 4 2/3
M 4 2/3
From the middle of one columne vnto the middle of the other ther is 15 Modells

Amongſt Ancient Buildings, we ſee no *Pedeſtals* to this Order, yet they are ſeen amongſt the Modern. And if you join a *Pedeſtal* to them, you muſt make the *Dado* of the *Pedeſtal* a perfect ſquare; and from it you muſt take the meaſures of its Ornament: Therefore it muſt be divided into four equal parts, the Baſe with its *Zocco* or *Plinth* muſt be two of them, and the *Cymacium* one, to which muſt be joined the *Orlo*, or *Plinth* of the Baſe of the Column. This kind of *Pedeſtal* may alſo be ſeen in the *Corinthian* Order, as at *Verona*, in the Arch which is called *De Lioni*. I have ſet down divers Meaſures of deſigns, which may be joined to the *Pedeſtal* of this Order, which are all very agreeable, and taken from Antiquity, and are very carefully meaſured. This Order hath no proper Baſe, wherefore in many Buildings, you may ſee Columns without Baſes; as in *Rome*, in the Theatre of *Marſellus*, in the Temple *De la Pieta*, near to the ſaid Theatre; in the Theatre of *Vicenza*, and in divers other places. But ſometimes the *Attick Baſe* is joined to them, which adds very much to their Beauty, and here is the meaſure of it.

The height is the half Diametre of the Column, and is divided into three equal parts; one is given to the *Zocco* or *Plinth*; the other two are divided into two parts, of one is made the *Torus* ſuperiour, and the other which remains is divided into two, and one is given to the *Torus* inferiour, and the other to the *Scocia*, or *Cavetto* with its *Annulets*. Therefore if you divide it into ſix parts, of one muſt be made the *Annulet* above, and the other that below, and four muſt remain to the *Scocia*. The projecture muſt be the ſixth part of the Diametre of the Column; the *Ceincture* muſt be the half of the upper *Torus*: If it be divided from the Baſe, its projecture muſt be the third part of the whole projecture of the Baſe. But if the Baſe and part of the Column ſhall be of one price, you muſt make the *Ceincture* ſmall; as you may ſee in the third deſign of this Order, where are alſo two manners of *Impoſts* of Arches.

A. *Body of the Column.*

B. *Annulet, or Ceincture.*

C. *The upper Torus.*

D. *Scocia with its Annulets.*

E. *The lower Torus.*

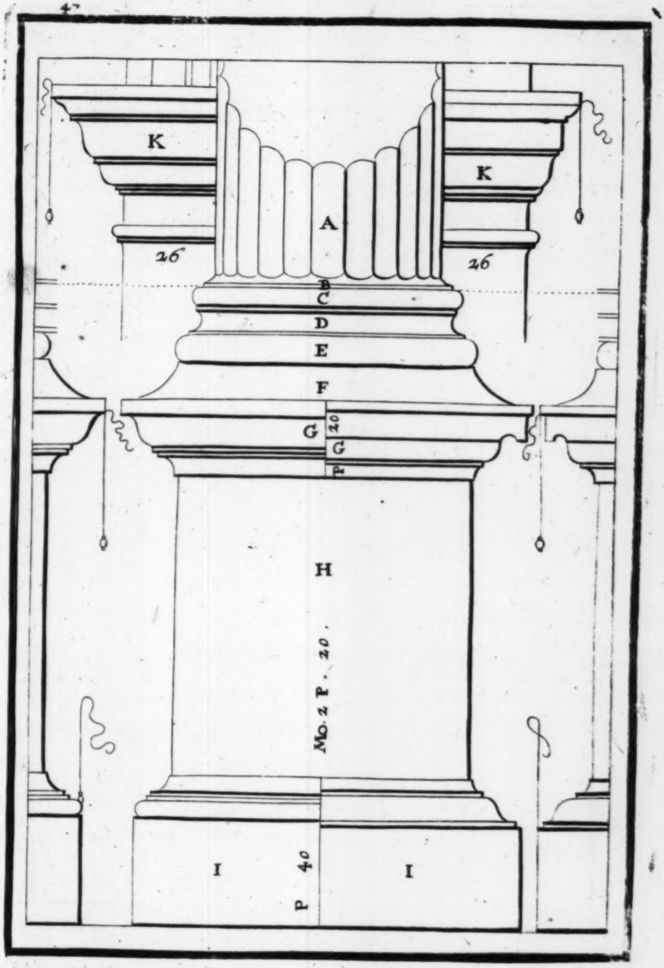
F. *Plinth, or Zocco,*

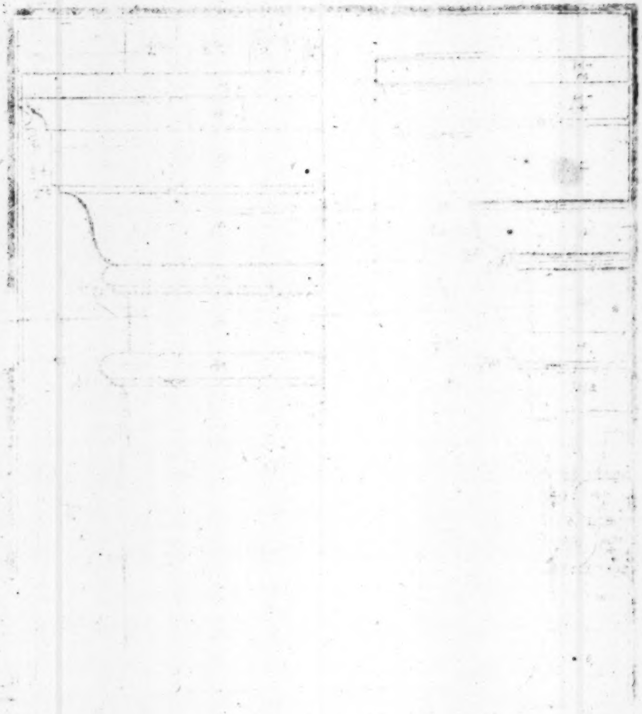
G. *Cimacium.*

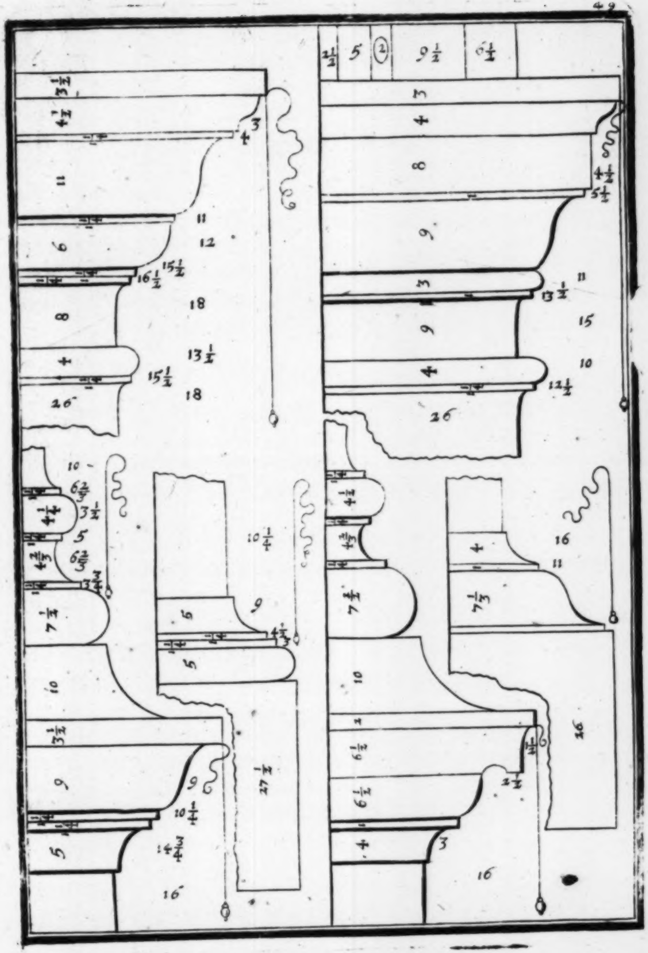
H. *Dado, or Square.* } *of the Pedeſtal.*

I. *Baſe.*

K. *Impoſts of Arches.*


K
K
A
26
26
B
C
D
E
F
G
20
G
P
H
Mo. 2 P. 20.
I
P 40
I





2½
5
2
9½
6½
3½
4½
3
4
11
12
15½
16½
18
8
13½
15½
26
4
10
6⅔
3½
5
7½
10
9
10¼
14¾
16
27½
10¼
9
4½
3
6
5
4
8
5½
13½
15
10
12½
4½
7½
6½
2½
16
11
7⅓
26
3

The height of the Capitel ought to be the half Diametre of the Column below, and is divided into three parts; that above ſhall be divided into five parts, three ſhall be for the *Abacus*; and the other two parts for the *Cimatium*, the which muſt be ſubdivided into three parts; of one is made the *Liſtilla*, or *Annnlet*, and of the other two, the *Scima Recta*. The ſecond part is divided into three equal parts, one is given to the *Annulet* which are three, and are equal, the other two which remains to the *Ouolo*, or *Echynus*, whoſe projecture is two thirds of its height. The third principal part of the ſaid Capitel, is for the *Hypotrachelinm*, or *Frize* of the Capitel, given to the *Collarino*; the whole projecture is the fifth part of the Diametre of the Column. The *Aſtragal* is as high as all the three *Annulets*, and is in projecture equal to the body of the Column below. The *Annulet* or *Ceincture*, is half the height of the *Aſtragal*, the projecture thereof is plum with the Centre of the ſaid *Aſtragal*.

Upon the Capitel is made the *Architrave*, which is to be in height half the thickneſs of the Column, that is to ſay, one Model; it is divided into ſeven parts, of one is made the *Tenia*, whoſe projecture muſt be equal to its height. The whole is divided into ſix parts, one whereof is given to the *Guttæ*, the which ought to be ſix in number, and to the *Liſtella* which is under the *Tenea*, which is a third of the ſaid *Guttæ*. The reſt is divided into ſeven parts, from the *Tenia* downwards, three whereof is given to the firſt *Faſcia*, and four to the ſecond. The *Frize* is in height a Model and a half, the breadth of the *Trigliph*, is one Model, and its Capitel is the ſixth part of a Model. The *Trigliph* is divided into ſix parts, two whereof is given to the two chanels in the middle, and one to the two half chanels at the extremities, and the other three make the ſpaces that are below the ſaid chanels. The *Metopa*, that is to ſay, the ſpace between two *Trigliphs* ought to be ſo broad as high.

The *Cornice* ought to be in height one Model, and a ſixth part, and is divided into five parts and a half; two whereof is given to the *Cavetto* and *Ouolo*; the *Cavetto* is leſs than the *Ouolo*, as much as is the *Liſtella*; the other three and half is given to the *Corona*, and ſor the *Scima Reverſa*, and *Scima Recta*.

The *Corona* ought to have in projecture four ſix parts of the Model; and on its plain which looketh downwards, and projecteth forth, muſt have in length ſix *Gutta*, and three in breadth over the *Trigliphs* with their liſts, and over the *Metopa* certain Roſes.

The *Gutta*, or bells, anſwer to thoſe which are under the *Tenea*, which are made in form like a Bell.

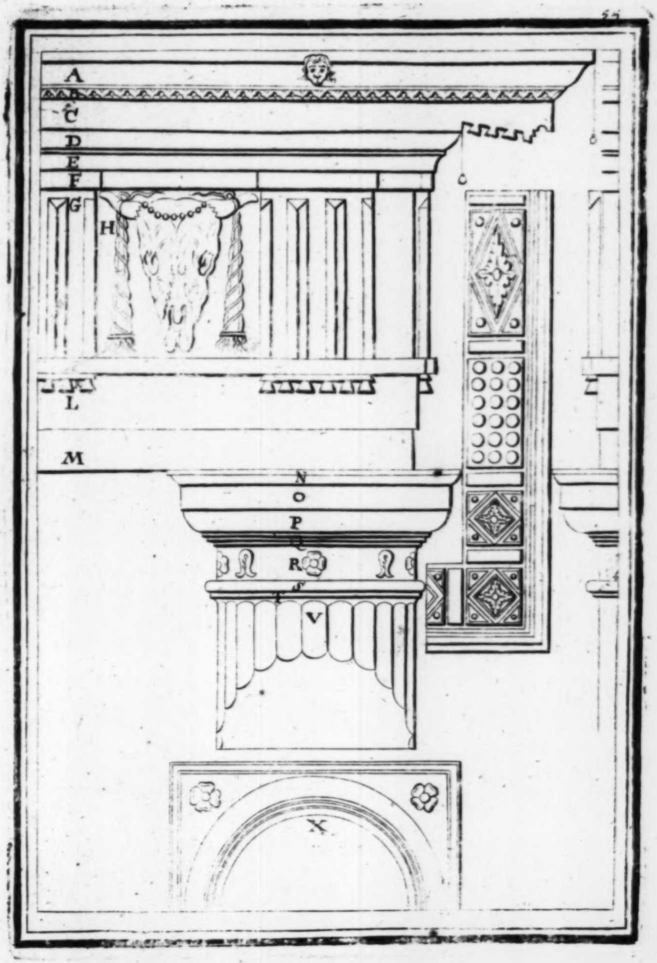
The *Cimatium* muſt be an eight part thicker than the *Corona*, and is divided into eight parts: Two whereof is given to the *Orlo* or *Liſtella*, and ſix remains to the *Cimatia*, whoſe projecture is ſeven parts and a half. Whereupon the *Architrave*, the *Frize*, and the *Cornice*, fall out to be in height the fourth part of the length of the Column; and theſe are the meaſures of the *Cornice*, according to *Vitruvius*, from whom I have a little ſwerved, altering the members, and making them a little bigger.

A. *Scima Recta.*
B. *Scima Reverſa.*
C. *Coronna.*
D. *Ouolo.*
E. *Cavetto.*
F. *The Capitels of the Trigliph.*
G. *Trigliph.*
H. *Metopa.*
I. *Tenia.*
K. *Guttæ.*
L. *Prima Faſcia.*
M. *Secunda Faſcia.*

Parts of the Capitel.

N. *Cimatium.*
O. *Abacus.*
P. *Ouolo, or Echinus.*
Q. *Annulets.*
R. *Hypotrachelium, or Frize.*
S. *Aſtragal.*
T. *Liſtella, or Ceincture.*
V. *Body of the Column.*
X. *The Plain of the Capitel, and the Model divided into thirty parts.*
Y. *The under part of the Coronna.*

CHAP.


A
B
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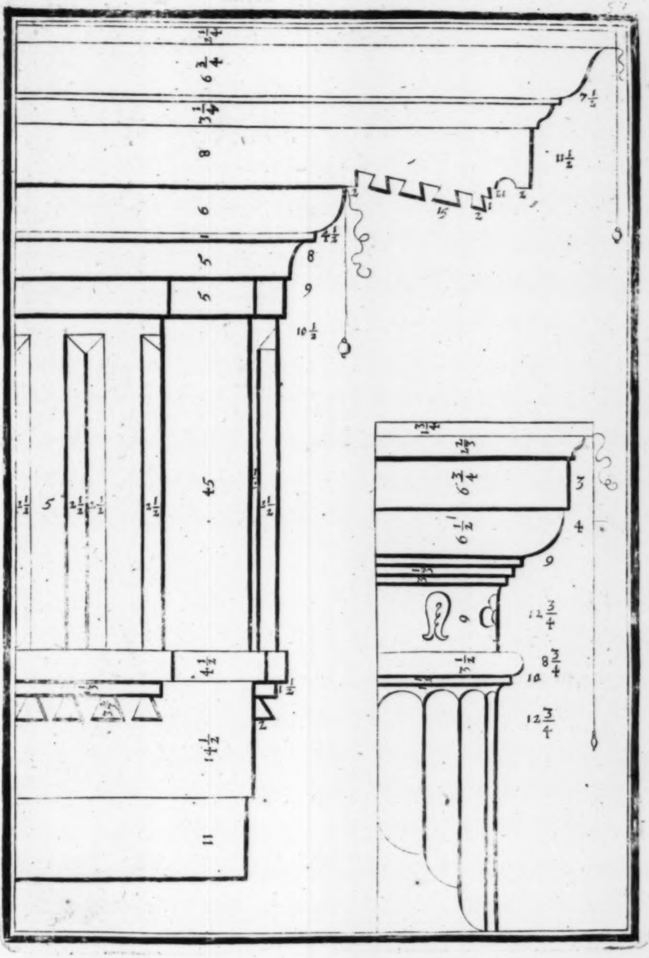
Q
R
S
T
V
X

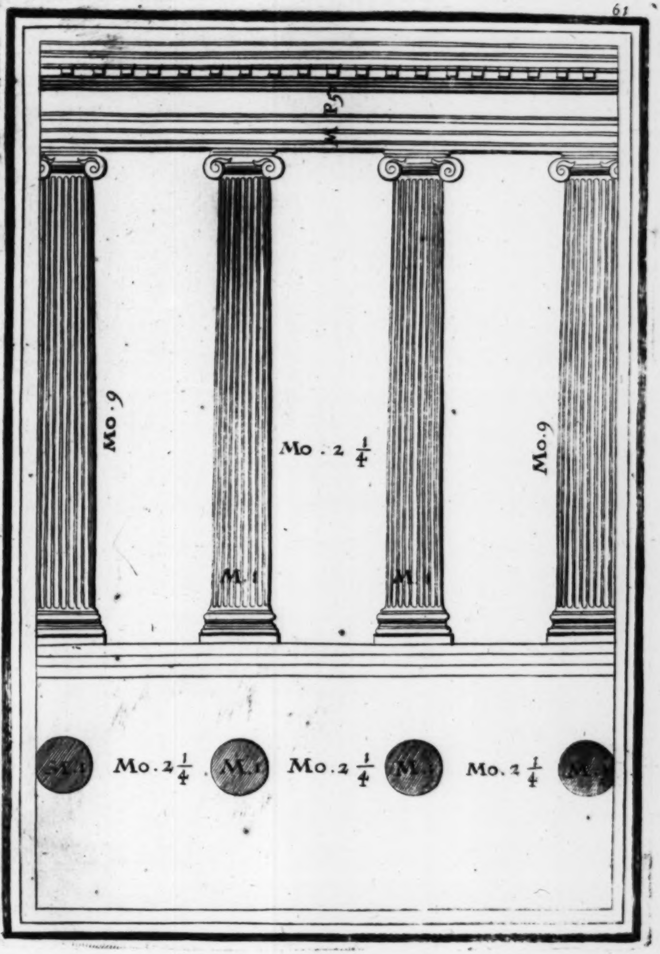


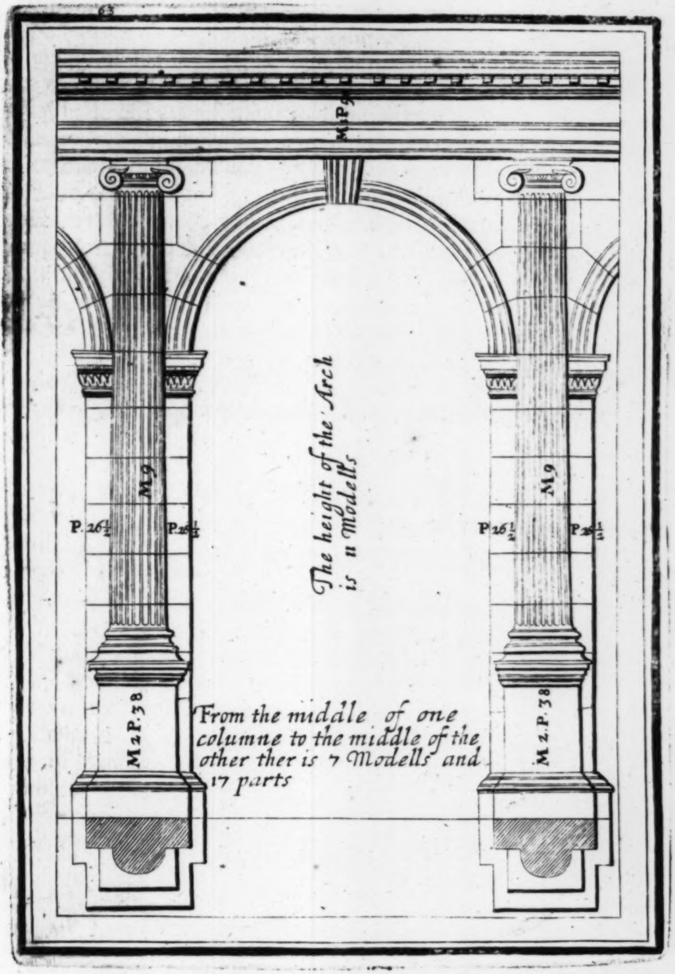
2 1/4
6 3/4
3 1/4
8
6
5
5
7 1/2
11 1/2
4 1/2
8
9
10 1/2
15
2
2 1/2
5
2 1/2
2 1/2
2 1/2
45
2 1/2
4 1/2
1 1/2
2
14 1/2
11
2 1/4
6 3/4
3
6 1/2
4
9
12 3/4
9
3 1/2
8 3/4
12 3/4

# CHAP. XVI.

## *Of the* Ionick *Order.*

THE *Ionick* Order had its Original in *Ionia*, a Province in *Aſia*; and we read, that the Temple of *Diana* at *Epheſus* was built of this order: The Columns with Capitel and Baſe, are nine models long, and by a model is underſtood the Diametre of the Column below. The *Archetrave*, *Frize*, and *Cornice*, are the fifth part of the height of the Column; in the following deſign, which is of Columns alone, the Inter-columns are of two Diametres, and a fourth part. And this is the faireſt and moſt commodious manner of Inter-columns, and by *Vitruvius* is called *Euſtillos*. In the other deſign, which is of Arches, the *Pilaſters* are in breadth a third part of the height of the Arch; and the Arches are in height two ſquares.


M. 2
Mo. 9
Mo. 2 $\frac{1}{4}$
Mo. 9
M. 1
M. 1
M. 1
Mo. 2 $\frac{1}{4}$
M. 1
Mo. 2 $\frac{1}{4}$
M. 1
Mo. 2 $\frac{1}{4}$
M. 1


M1P9
M 9
M 9
P. 26½
P. 26½
P 26½
P 26½
M 2 P. 38
M 2 P. 38
The height of the Arch is 11 Modells
From the middle of one columne to the middle of the other ther is 7 Modells and 17 parts

If you put a *Pedeſtal* to the Column of the *Ionick* Order, as in the deſign of the Arches, it muſt be made as high as half the breadth of the light of the Arch, and muſt be divided into ſeven parts and half, of two of them ſhall be made the Baſe of one; the *Cimatium*, and half, which remains, ſhall be for the *Dado*, or ſquare of the *Pedeſtal.*

The Baſe of this Order is in thickneſs half a model, and is divided into three parts; one is for the *Plinth*, it's projecture is the fourth part of the ſaid thickneſs, and conſequently the eight part of a model. The other two parts of the Baſe are divided into ſeven, of three is made the upper *Torus*; the other four are divided again into two parts, one is given to the *Scotia* above, and the other to that below, which ought to have more projecture then the other.

The *Aſtragals* ought to have the eight part of the *Scotia*; the *Ceincture* of the Column is the third part of the *Torus* of the Baſe; but if it be ſo that you make the Baſe join with part of the Column, you muſt make the *Ceincture* ſmall, as I have alſo ſaid in the *Dorick* Order, the *Ceincture hath* in projecture half the projecture aforeſaid; theſe be the meaſures of the *Ionick* Baſe, according to *Vitruvius.*

But becauſe in many antique buildings are ſeen to this Order *Attick* Baſes, and to me ſeems more agreeable, upon the *Pedeſtal*; I have deſigned the *Attick* Baſe with a ſmall *Torus* or *Aſtragal*, under the *Ceincture*; not omitting therefore to make the deſign thereof as *Vitruvius* teacheth us.

The deſignes *L.* are two different profiles for to make the Impoſts of Arches; and of each there is ſet down the Meaſures by Numbers, which ſhew the parts of a model, as is done in all the other deſigns; theſe *Impoſts* are in a height half as much again as the thickneſs of the *Pillaſter* which ſupports the Arch.

**A.** *Body of the Column.*

**B.** *The Aſtragal with the Ceincture, which are members of the Column.*

**C.** *Upper Torus.*

**D.** *The hollow called Scotia.*

**E.** *The lower Torus.*

**F.** *The Plinth faſtned to the Cymatium of the Pedeſtal.*

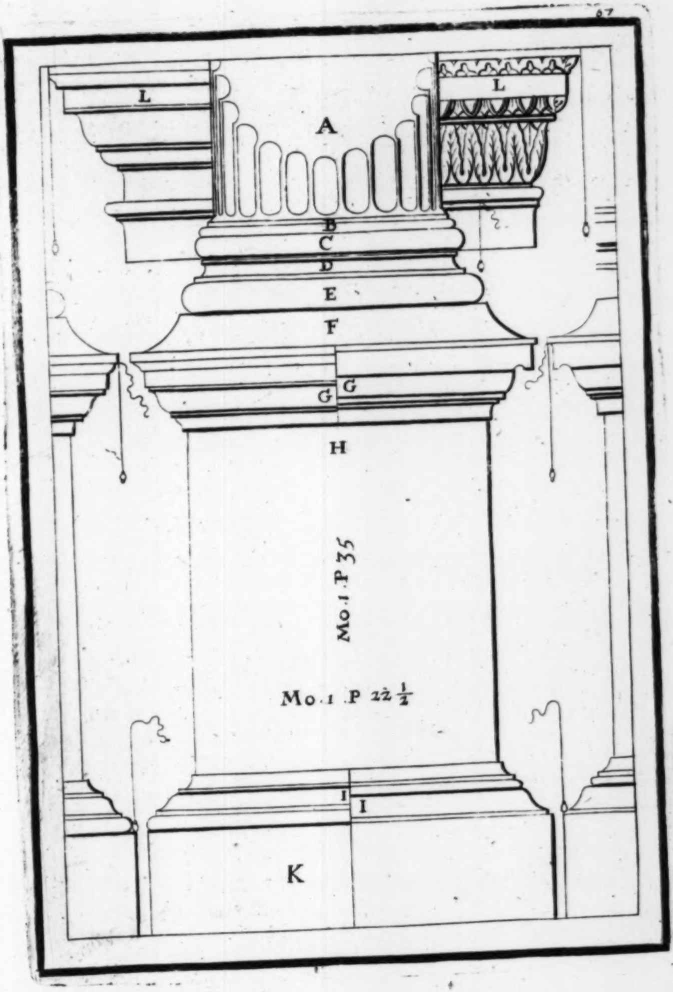
**G.** *Cymatium in two formes*

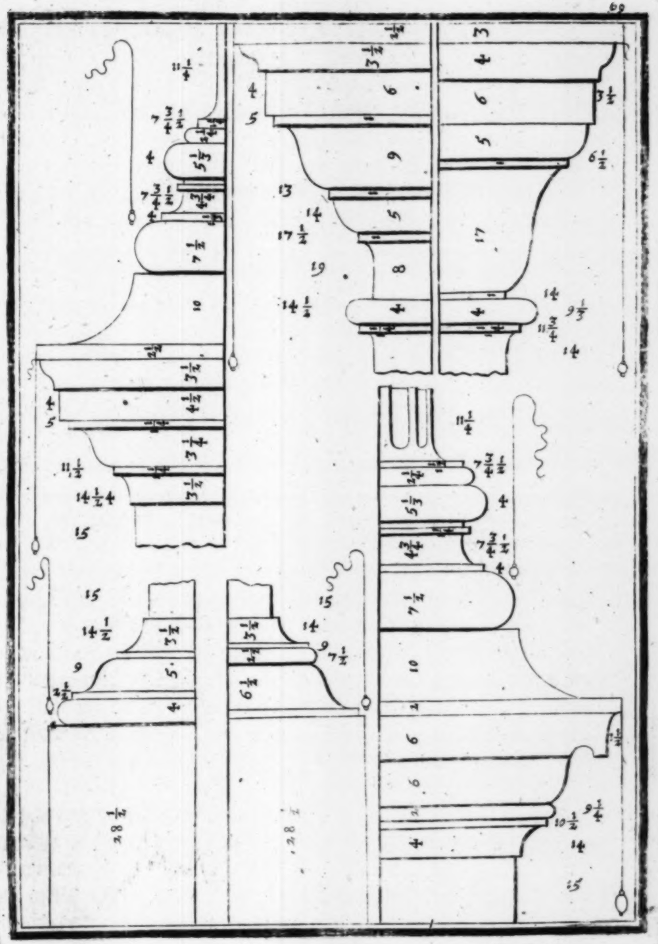
**H.** *Dodo, or plain ſquare* } *of the Pedeſtal.*

**I.** *Baſe in two formes.*

**K.** *Orlo, or Plinth.*

**L.** *Impoſts for the Arches.*


L
L
A
B
C
D
E
F
G
G
H
Mo.1 .P 35
Mo.1 .P 22 1/2
I
I
K


11 1/4
7 3/4 1/2
4
5 1/3
4
7 1/2
10
3 1/2
4 1/2
3 1/4
3 1/2
11 1/2
14 1/2 4
15
3 1/2
4
6
5
9
6 1/2
13
14
5
17
17 1/2
19
8
14 1/2
4
14
9 1/3
11 3/4
14
15
14 1/2
9
5
2 1/2
4
7 1/2
6 1/2
28 1/2
10
6
9 1/4
10 1/2
15

To make the *Capitel*, the foot of the Column muſt be divided into eighteen parts, and nineteen of ſuch parts is the breadth and length of the *Abacus*, and the half is the height of the *Capitel* with the *Voluta*; whereupon it becomes to be nine parts and a half high: One and half is for the *Abacus* with its *Cimatium*, the other eight remains to the *Voluta*, which is made in this manner. From the extremity of the *Cimatium*, within, is placed one of the nineteen parts, and from the point which is there made, is let fall a line plumb, which divides the *Voluta* in the middle, and is called *Catheta*; and where the point falls in this line which ſeperates the four parts and half above, and the three and half below, there is made the Centre of the eye of the *Voluta*; whoſe Diametre is one of the eight parts; and from the ſaid point is drawn a line which intercects at right Angles. The *Catheta* divides the *Voluta* into four parts, in the eye of which is formed a ſquare, the bigneſs whereof is the half Diametre of the ſaid eye. The *Diagonal* lines being drawn in it, in them are made the points whereon the fixed foot of the *Compaſs* is to ſtand to make the *Voluta*, and they are (computing the Centre of the eye) thirteen Centres; as to the Order which muſt be obſerved in them, it appears by the number placed in the deſign. The *Aſtragal* of the Column is right againſt the eye of the *Voluta*; the *Volutes* are as thick in the middle as is the *projecture* of the *Ouolo* or *Echinus*, which reacheth beyond the *Abacus*, ſo much as is the eye of the *Voluta*; the hollow of the *Voluta* is even with the body of the Column. The *Aſtragal* of the Column turns about under the *Voluta*, and is alwayes ſeen: As appears in the platform of the Column; and 'tis natural, that ſo ſlender a thing as is the *Voluta* ſhould give way to one ſo hard as is the *Aſtragal*; and the *Voluta* is alwayes equally diſtant from it.

They were wont to make in the Angles of Rowes, of Columns, or Porches of the *Ionick* Order, *Capitels* which had the *Voluta* not only in the front, but alſo in that part that, making the *Capitel* as they were wont to do, would be the flank; whereupon they come to have the front on two ſides, and are called *Angular Capitels*; and how they made them, I ſhall demonſtrate in my Book of Temples.

A. *Abacus.*

B. *Hollowes of the Voluta.*

C. *Ouolo, or Echinus.*

D. *Aſtragal under the Echinus.*

E. *Ceincture, or Annulet.*

F. *Body of the Column.*

G. *Line called Catheta.*

On the Plat-form of the Capitel of the Column, the ſaid Members are marked with the ſame Letters.

S. *The eye of the Voluta in a large form.*

*Members of the Baſe, according to* Vitruvius.

K. *Body of the Columns.*

L. *Ceincture, or Annulet.*

M. *Torus.*

N. *Scotia prima.*

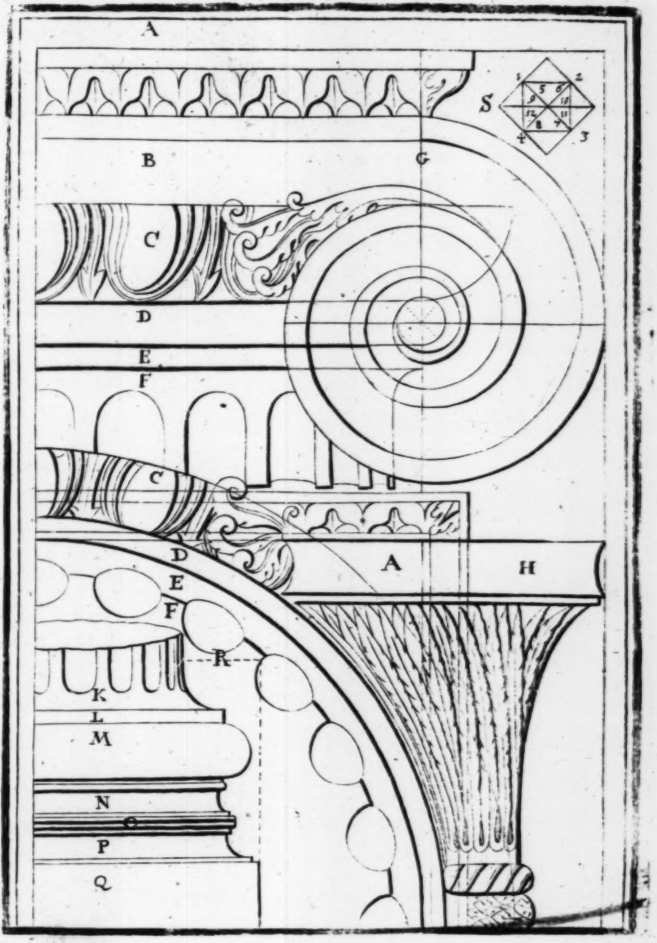
O. *Tondino, or Aſtragal.*

P. *Scotia ſecunda.*

Q. *Orlo, or Plinth.*

R. *Projecture of the Baſe.*

The


A
S
1
2
5
6
9
10
12
11
8
7
4
3
B
G
C
D
E
F
C
D
E
F
A
H
R
K
L
M
N
O
P
Q

The *Architrave*, *Frize*, and *Cornice*, make ( as I have ſaid ) the fifth part of the height of the Column, and the whole is divided into twelve parts; the *Architrave* four, the *Frize* three, and the *Cornice* five: The *Architrave* is divided into five parts, of one is made the *Cimatium*, and the reſt are divided into twelve, three are given to the firſt *Faſcia*, and its *Aſtragal*, four to the ſecond and its *Aſtragal*, and five to the third.

The *Cornice* is dividen into ſeven parts, $\frac{3}{4}$. two are given to the *Scotia* and *Ouolo*, two the *Modilions*, and the $\frac{3}{4}$. to the *Corona*, and *Scima Recta*, and projecteth forwards as much as its thickneſs.

I have deſigned the Front, the Flank, and the Plat-form of the *Capitel*, the *Architrave*, *Frize*, and *Cornice*, with their convenient Sculptures.

A. *Scima Recta.*

B. *Scima Reverſa.*

C. *Corona.*

D. *Cimatium of the Modilions.*

E. *Modilions.*

F. *Ouolo.*

G. *Cavetto.*

H. *Frize.*

I. *Cimatium of the Architrave.*

K. L. M. *Are the firſt, ſecond, and third Faſcia.*

Members of the Capitel.

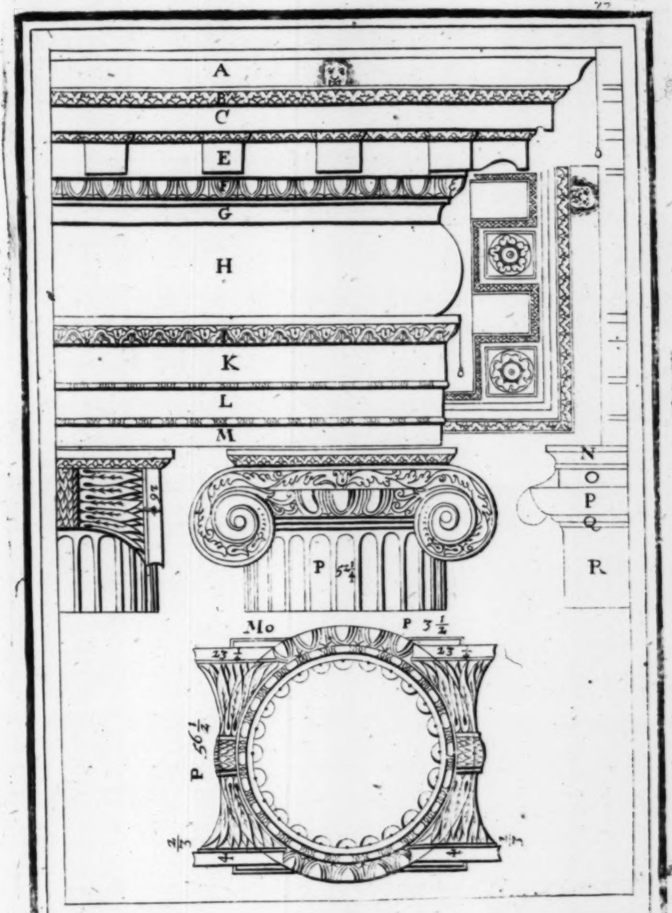
N. *Abacus.*

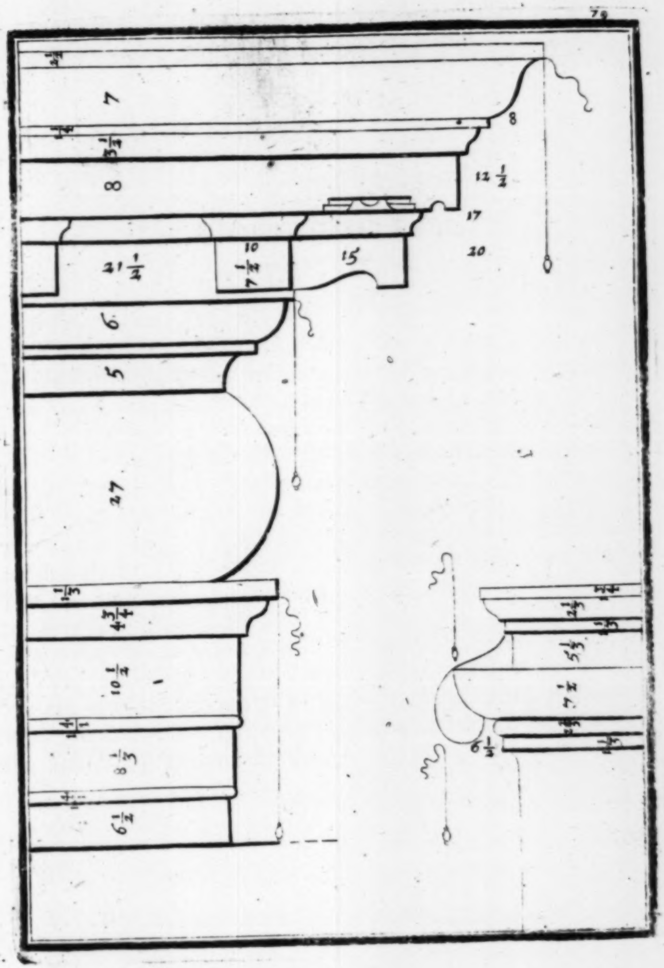
O. *Hollow of the Voluta.*

P. *Ouolo, or Echinus.*

Q. *Aſtragal of the Column.*

R. *Body of the Column.*


A
B
C
E
F
G
H
I
K
L
M
N
O
P
Q
R
P 52¼
Mo
P 3½
23½
23½
P 56½
⅔
⅔
92


7
8
8
12 ½
17
20
21 ½
10
7 ½
15
6
5
27
⅓
4 ¾
10 ½
8 ⅓
6 ½
6 ½
7 ½
5 ⅓
2 ⅓

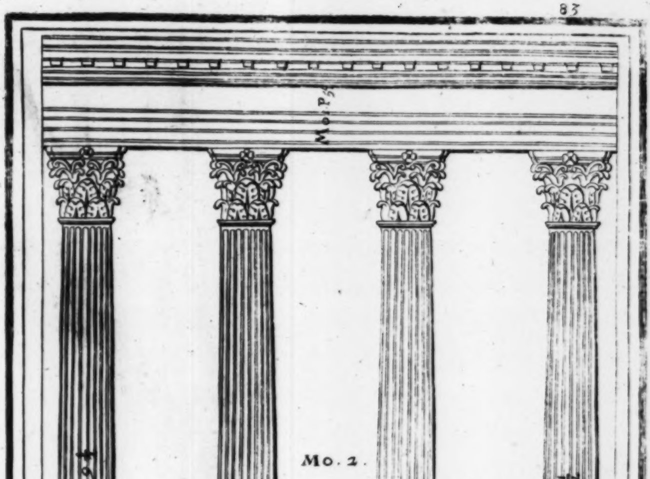
## CHAP. XVII.

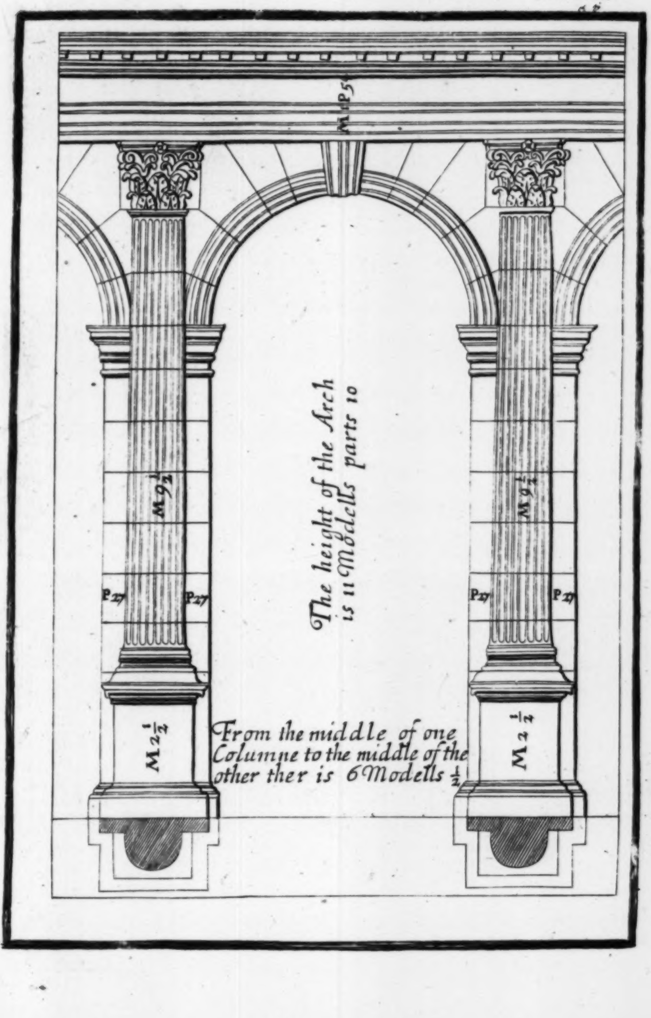
## *Of the* Corinthian *Order.*

AT *Corinth* a noble City of *Peloponeſe*, or *Moree*, firſt of all was found the Order which is called *Corinthian*, which is more adorned and beautified then any I have yet treated on.

The Columns are like the *Ionick*, and with the *Baſe* and *Capitel* joined to them, they are nine models and a half long. If you make them fluted, they muſt have 24. flutes or channels, which muſt be made half ſo deep as broad: The plains or ſpaces between one flute and the other muſt be a third part of the breadth of the ſaid flutes. The *Archetrave*, *Frize* and *Cornice*, are a fifth part of the height of the Column; in the deſign of Columns alone, the Inter-columns are two Diametres, as is the Portal of St. *Maria Rotunda* in *Rome*; and this form of Rowes of Pillars, is by *Vitruvius* called *Syſtylos*. And in that of Arches, the *Pilaſters* are of two parts of five of the light of the Arch; and the light of the Arch is in height two ſquares and half the thickneſs of the Arch being comprehended.

83




M 1 P 5
The height of the Arch
is 11 Modells parts 10
M 9½
M 9½
P 27
P 27
P 27
P 27
M 2½
M 2½
From the middle of one
Columne to the middle of the
other ther is 6 Modells ½

The *Pedeſtal* under the *Corinthian* Column muſt be in height a fourth part of the length of the Column, and being divided into eight parts, one is given to the *Cimatium*, two to its *Baſe*, and five remains to the *Dado*, or plane of the *Pedeſtal*; the *Baſe* muſt be divided into three parts, two for the *Zocco* or *Plinth*, and one to the *Cornice*.

The *Baſe* of the Column is the *Attick*, but in this Order it differs from that which is put to the *Dorick* Order: In this the *Projecture* is the fifth part of the Diametre of the Column, whereas in the *Dorick* it is the ſixth part; it may alſo vary in ſome other parts, as may be ſeen in the deſign, where alſo is ſet down the *Impoſts* of the Arches, the which is in height one half more then the thickneſs of the *Membretto*, that is to ſay, the *Pillaſter* which bears up the Arch.

A. *Body of the Column.*

B. *Ceincture and Aſtragals of the Column.*

C. *The upper Torus.*

D. *Scotia with the Aſtragals.*

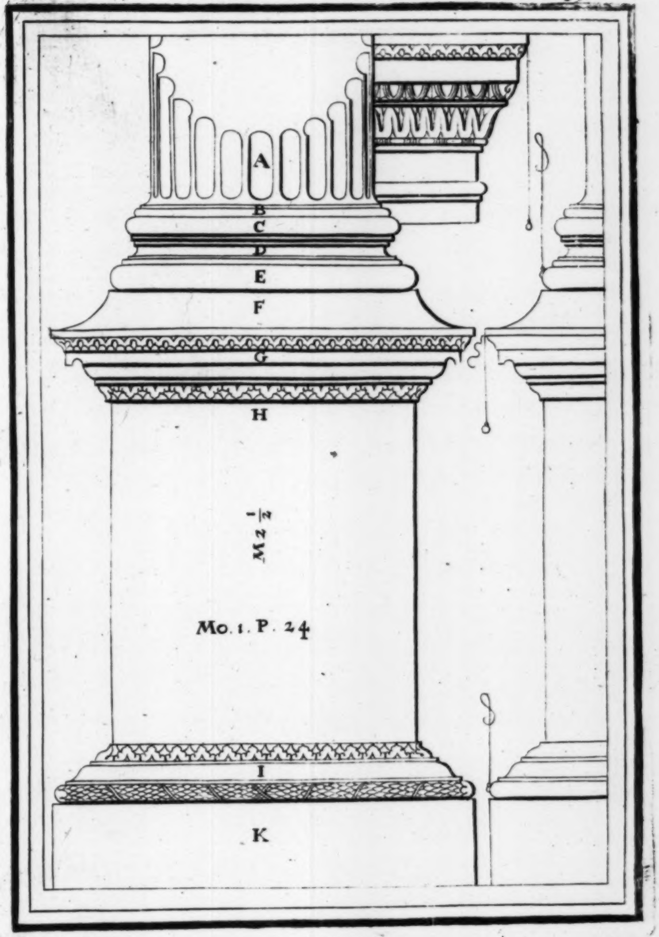
E. *The lower Torus.*

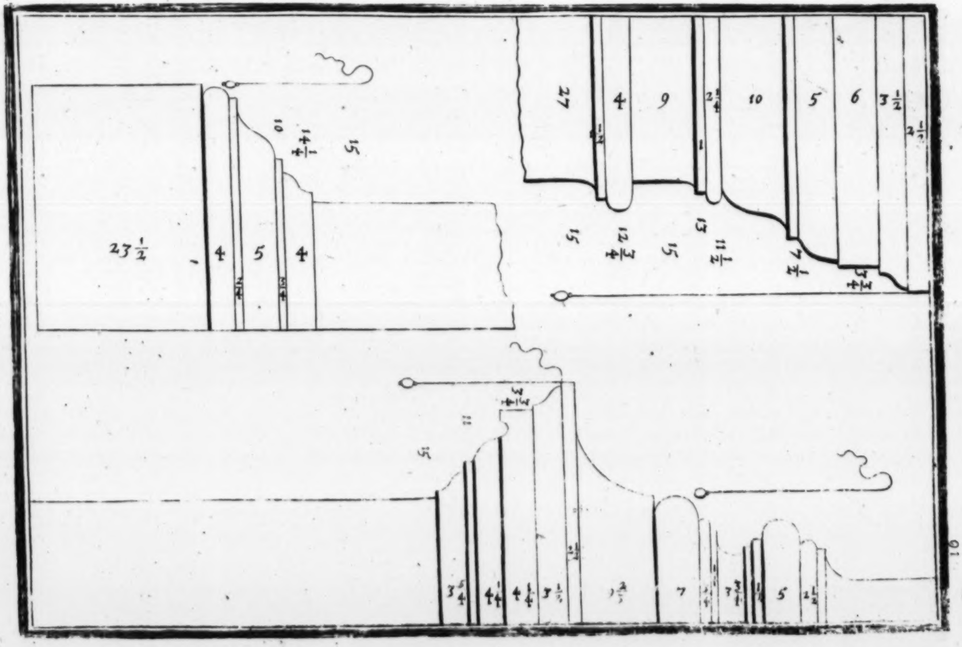
F. *Orlo, or Plinth of the Baſe faſtned to the Cimatium of the Pedeſtal.*

G. *Cimatium*
H. *Dado or plain* } *of the Pedeſtal.*
I. *Coronna of the Baſe*

K. *Orlo, or Plinth of the Baſe.*

*The Impoſt of the Arch is at the ſide of the Column.*

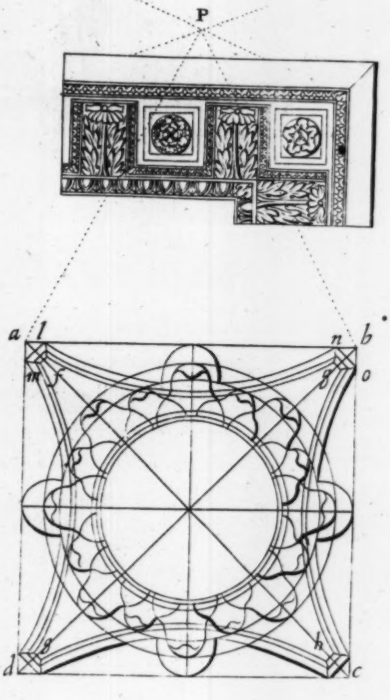

A
B
C
D
E
F
G
H
M 2 ½
Mo. 1. P. 24
I
K

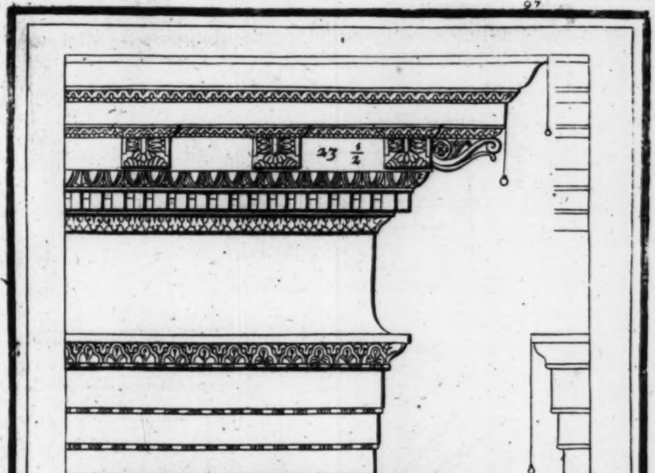

27
4
1/2
9
2 1/4
1
10
5
6
3 1/2
2 1/2
15
12 3/4
15
13
11 1/2
7 1/2
3 3/4
23 1/2
4
3/4
5
3/4
4
10
14 1/4
15
3 3/4
11
15
3 5/4
4 1/4
4 1/4
3 1/2
2 1/2
1 2/3
7
1/4
7 3/4
1/4
5
2 1/2

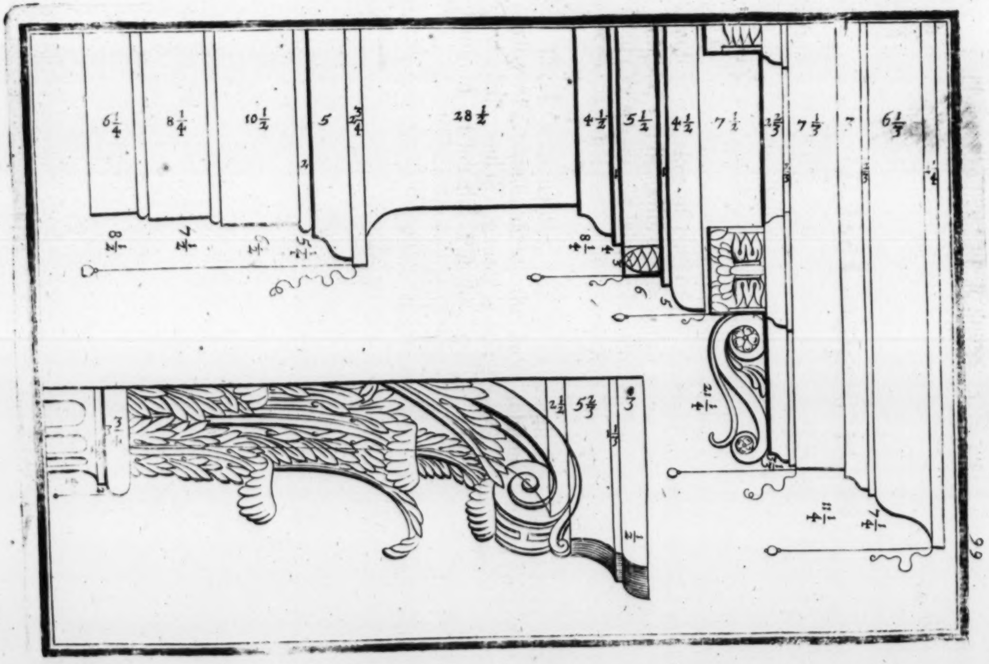
The *Corinthian Capitel* ought to be as high as the thickneſs of the Column below, and a ſixth part more which is allowed to the *Abacus*; the reſt is divided into three equal parts, the firſt is given to the firſt leaf, the ſecond to the ſecond ; and the third is divided again into two, and of that part next the *Abacus* is made the *Caulicoli* with the leaves, which ſeem to ſupport them whence they grow; and therefore the ſtalk from whence they grow muſt be made thick, and in their foldings muſt diminiſh by little and little : The example hereof is taken from plants, which are bigger at the root then at the extremity of the branches. The Bell which is the body of the *Capitel* under the leaves, ought to be direct to the bottoms of the flutes of the Column.

To make the *Abacus*, that it may have a convenient *Projecture*, make the ſquare A B C D. each ſide whereof muſt be a *Model* and half, and the *Diagonal Lines* muſt be drawn in it from one Angle to the other, and where they interſect each other in the point E. which is the middle and centre of the ſaid ſquare ; the fixed foot of the *Compaſs* muſt be placed, and towards each Angle of the ſquare muſt be marked a *Model*; and where the points F G H I. are, the lines muſt be drawn, which intercects at right Angles with the ſaid *Diagonals*, and that they may touch the ſides of the ſquare in L M N O. Theſe ſhall be the bounds of the *Projecture*, and how much the length is, ſo much ſhall be the breadth of the hornes of the *Abacus*.

The *Curvature*, or hollowing of the *Abacus*, is made by laying a long a thred from one horn to the other, which is from the point L. to the point N. then from the ſaid points, draw two Arches of Circles, then ſet in one foot of the *Compaſs* in the interſection at the point P, with the other deſcribe the Arch, which will make the hollowing or curvature of the *Aſtragal* of the Column, and is ſo made that the tongues of the leaves toucheth it, or rather advanceth a little beyond, and this is their *Projecture*. The Roſe ought to be as large as the fourth part of the Diametre of the Column at the foot : The *Archetrave*, *Frize* and *Cornice* (as I have ſaid) are to be a fifth part of the height of the Column , and the whole is to be divided into twelve parts, as in the *Ionick*; but here is the difference ; in this the *Cornice* is divided into eight parts and half, of one is made the Intabliment, of the other the *Dendiculi*, of the third the *Ouolo*, of the fourth and fifth the *Modilions*, and of the other three and half the *Coronna*, and the *Scima*. The *Cornice* hath as much *Projecture* as it is high, the Coffers or places of the Roſes that go between the *Modilions* muſt be ſquare, and the *Modilions* as big as half the plain of the ſaid Roſes. The members of this Order have not been marked with Letters as the foregoing, becauſe by them theſe may eaſily be underſtood.


P
a
l
n
b
m
f
g
o
g
h
d
c


23 1/4
Mo. 1

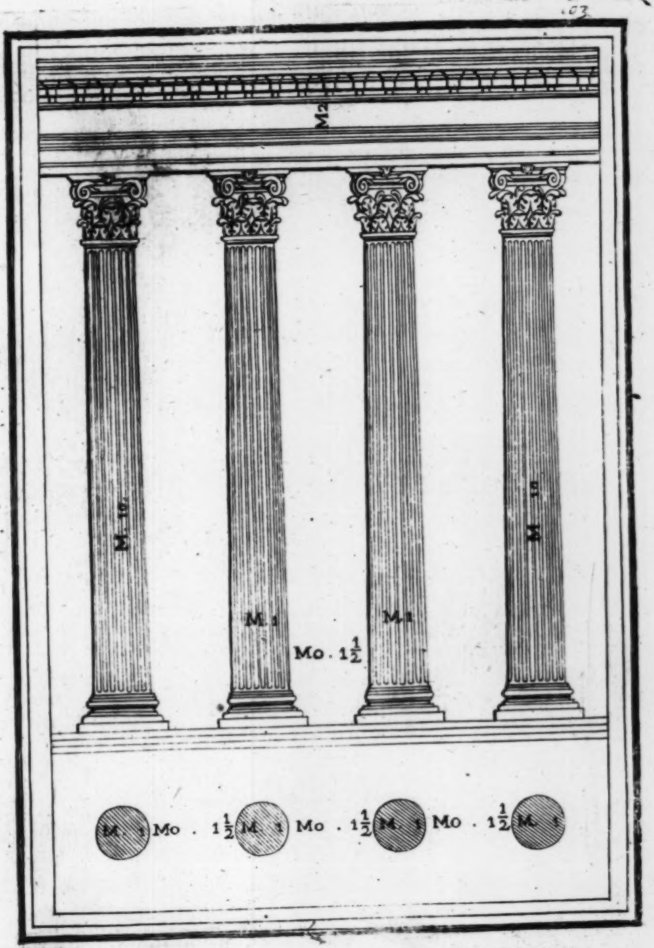

6 1/4
8 1/4
10 1/2
5
2 3/4
28 1/2
4 1/2
5 1/2
4 1/2
7 1/2
2 2/3
7 1/3
7
6 1/3
8 1/2
7 1/2
6 1/2
5 1/2
8 1/4
4
3
6
5
21 1/4
11 1/4
7 1/4
2 1/2
5 2/3
3
1/2
3 1/4

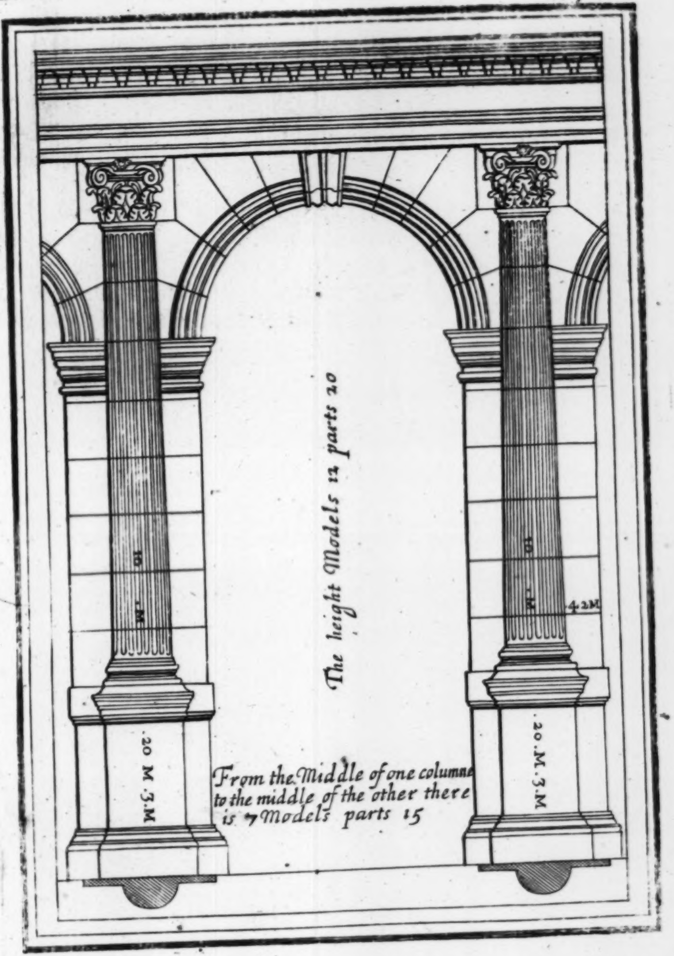
## CHAP. XVIII.

## *Of the* Compoſita *Order.*

THE *Compoſita* Order, which is alſo called *Roman*, becauſe it was an Invention of the Ancient *Romans*, and is ſo called becauſe it partakes of two of the aforeſaid Orders; and the moſt Regular and Beautiful is that which is compounded of the *Ionick* and *Corinthian*; it is more ſlender then the *Corinthian*, and may be made like it in all parts, except in the *Capitel.*

Theſe Columns ought to be in length ten *Models*; in the deſign of Columns alone, the Inter-columns are one Diametre and a half, and this manner is called by *Vitruvius Picnoſtilos*. In thoſe of Arches the *Pillaſters* are half the light of the Arch, and the Arches are in height under the Vault two ſquares and half, that is to ſay, two Diametres and half of the light of the Arch.


M2
M. 10
M. 1
M. 1
Mo . 1½
M. 10
M. 1
Mo . 1½
M. 1
Mo . 1½
M. 1
Mo . 1½
M. 1

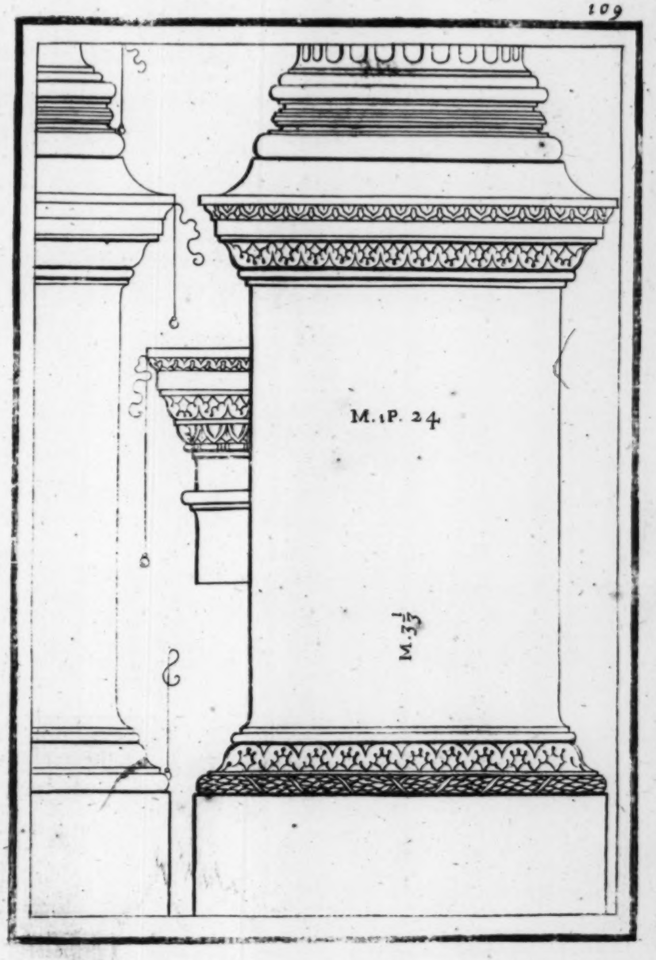

The height Models 12 parts 20
10
1 M
10
1 M
4.2M
20 M .3.M
20 .M .3.M
From the Middle of one columne to the middle of the other there is 7 Models parts 15

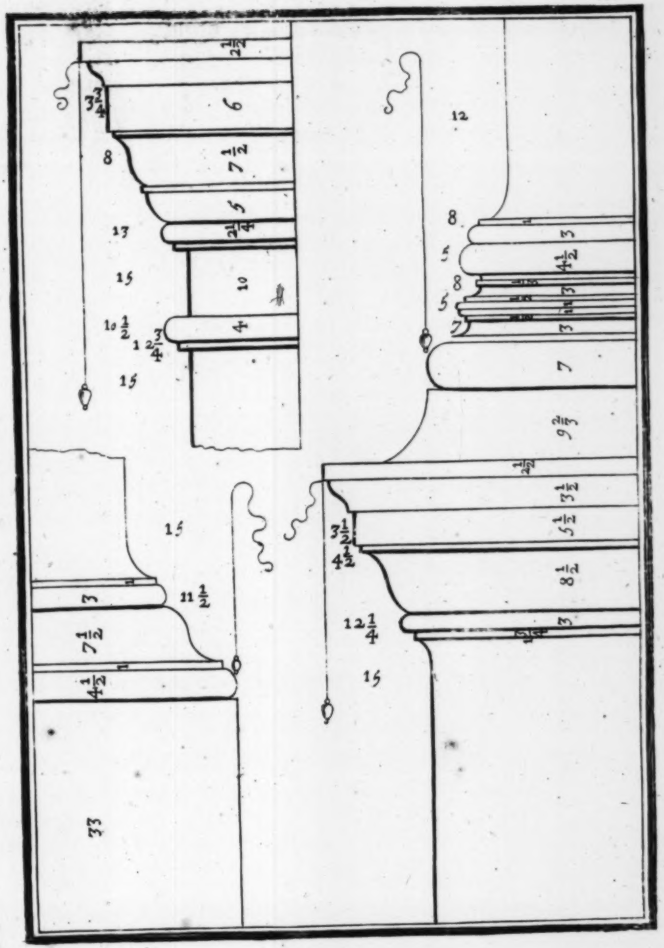
And becauſe (as I have ſaid) this Order ought to be made more neat and ſlender then the *Corinthian*, its *Pedeſtal* is to be the third part of the height of the Column, and is divided into eight parts and half; of one part is made the *Cimatium* of the *Baſe*, and five and half remains to the *Dodo* or *Plinth* of the *Pedeſtal*; the *Baſe* of the *Pedeſtal* is divided into three parts, two is given to the *Zocco* or *Plinth*, and one to its *Torus* with its *Cimatium*.

The Baſe of the Column may be made *Attick* as in the *Corinthian*, and it may alſo be compounded of the *Attick* and the *Ionick*, as appears in the deſign. The *Profile* of the Impoſt of the Arches, is by the ſide of the plain of the *Pedeſtal*, and its height is as much as the thickneſs of the *Membretto*.

[illegible] Column, [illegible]
[illegible] any part in the [illegible]
[illegible] and [illegible] contains to the Distance [illegible]
[illegible]
[illegible] the Base or [illegible]

The Base of the Column may be [illegible]
and it may [illegible] compounded of the [illegible]


M.1P. 24
M.3⅓

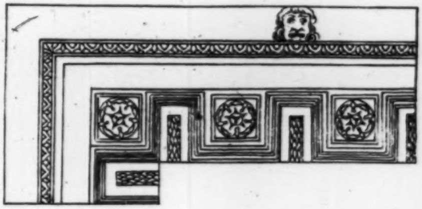

2½
3¾
6
8
7½
5
13
2¼
15
10
10½
4
12¾
15
12
8
3
5
4½
8
5
3
7
3
7
½
3½
3½
5½
4½
8½
12¼
3
15
15
11½
3
7½
4½
33

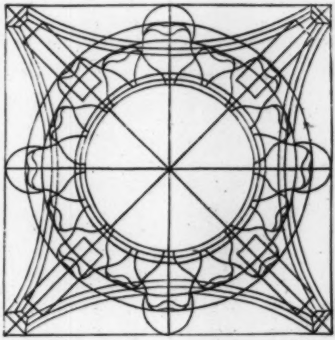
The Capitel of the *Compoſita* Order hath the ſame meaſures as the *Corinthian*, but it differs from it in the *Voluta*, *Ouolo*, *Fuſarolo*, or *Fuſe*, which are members attributed to the *Ionick*; and the way of making it, is thus: From the *Abacus* downwards, the Capitel is divided into three parts, as in the *Corinthian*: The firſt is given to the firſt leaves, the ſecond to the ſecond, and the third to the *Voluta*, which is made in the ſame manner, and with the ſame points with the which the *Ionick* is ſaid to be made, and takes up ſo much of the *Abacus*, that it ſeems to grow out of the *Ouolo* near the flowers which are put in the middle of the Curvatures of the ſaid *Abacus*, and is as thick in the front, as the breadth of the hornes thereof and a little more: The *Ouolo* is as big as three parts of five of the *Abacus*, and its lower part begins right againſt the lower part of the eye of the *Voluta*; it hath in *Projecture* $\frac{1}{4}$. parts of its height, and is with it-*Projecture* perpendicular to the hollow of the *Abacus*, or a little more.

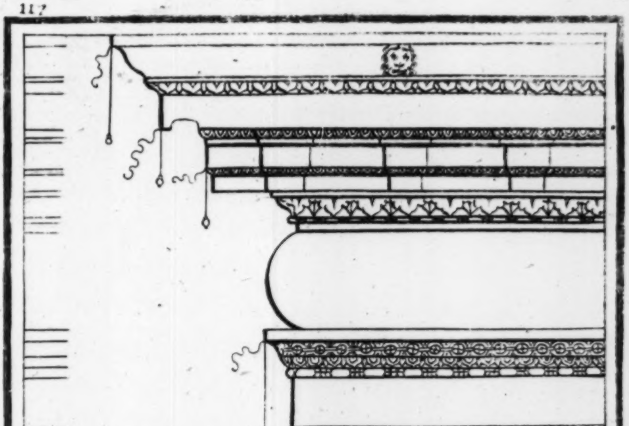
The *Fuſe* is a third part of the height of the *Ouolo*, and hath in *Projecture* ſomething more then the half of its thickneſs, and turns about the Capitel under the *Voluta*, and is alwayes ſeen. The *Gradetten*, or Moulding, which goes under the *Fuſe*, and makes the *Orlo* of the Bell of the Capitel, is the half of the *Fuſe*: The body of the Bell anſwers direct with the bottom of the flutes of the Column; of this ſort I have ſeen one at *Rome*, from which ſort I have drawn the ſaid Meaſures, becauſe it appeared to me very beautiful, and well ordered.

There are Capitels made after another manner, which may be called *Compoſita*, of which ſhall be diſcourſed, and the figures thereof ſhall be put in my Books of Antiquities.

The *Archetrave*, *Friſe* and *Cornice*, are the fifth part of the height of the Column, and their Compartiments may be well known by that which hath been ſaid before in the other Orders, and by the numbers placed in the deſign.



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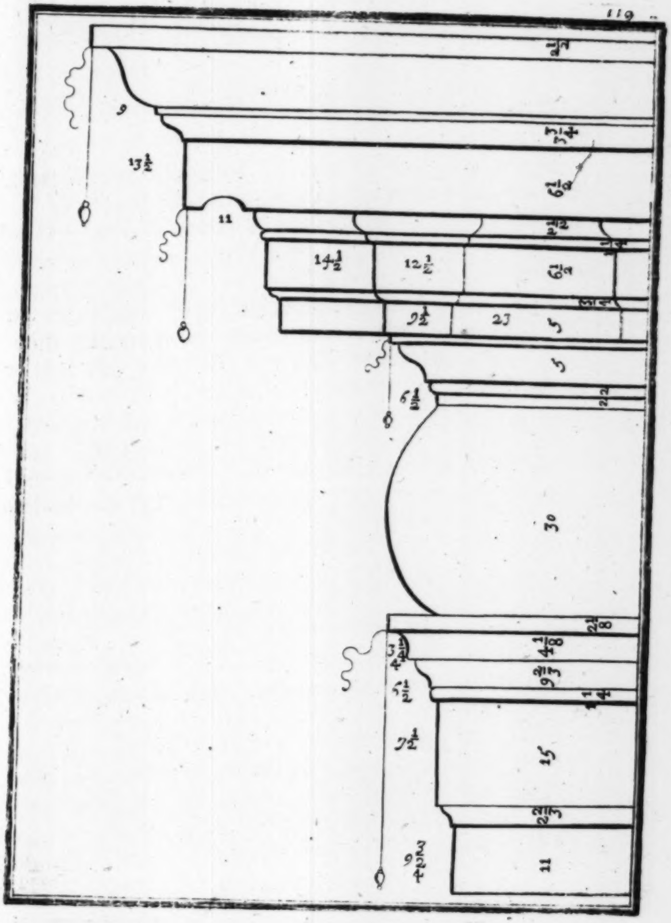
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11

# CHAP. XIX.

## *Of Pedeſtals.*

HItherto I have diſcourſed (what to me ſeemed convenient) of Walls and their Ornaments, and in particular, touching the *Pedeſtals* which may be applied to every Order; but becauſe it appears that the Ancients had not a regard to make the *Pedeſtal* bigger for the one Order than for another, although this part much adds to the beauty and Ornament, when it is made with diſcretion and proportion to the other parts; to the end that the Architects may take notice and ſerve themſelves upon occaſion, and know that they made them ſometimes ſquare, that is to ſay, as long as broad, as in the Arch *Di Lioni*, at *Verona*. And theſe I have aſſigned to the *Dorick* Order, becauſe it requires Solidity; ſometimes they are made taking the meaſure from the light of the Arch, as in the Arch of *Titus* at *Sancta Maria Nova* in *Rome*, and in that of *Trajan* on the gate of *Ancona*, where the *Pedeſtal* is half the height of the light of the Arch; and of that kind of *Pedeſtal* I have put to the *Ionick* Order; and ſometimes they took the meaſure from the height of the Column; as is ſeen at *Suſa*, a City ſcituate at the foot of the Mountain which divides *Italy* from *France*, in an Arch made to the honour of *Auguſtus Caſar*, and in the Arch of *Pola*, a City of *Dalmatia*, and in the Amphitheatre of *Rome*, in the *Ionick* and *Corinthian* Order, in which Building the *Pedeſtal* is the fourth part of the height of the Column, as I have made in the *Corinthian* Order. In *Verona*, in the Arch *Di Caſtel Vecchio*, which is very beautiful, the *Pedeſtal* is a third of the height of the Column, as I have put in the *Compoſita* Order; and theſe are the handſomeſt formes of *Pedeſtals*, and have the beſt proportion with their other parts: And when *Vitruvius* diſcourſing of Theaters makes mention of the *Poggio*, you may know that the

*Poggio* is the ſame with the *Pedeſtal*, which is the third of the length of the Column put for Ornament of the Scene; but of *Pedeſtals* which exceed a third of the Column, ſuch are ſeen at *Rome* in the Arch of *Conſtantine*, where the *Pedeſtals* are two parts and half of the height of the Column; and almoſt in all the Ancient *Pedeſtals*, the Baſes are obſerved to have been made twice as big as the *Cimacium*, as is ſeen in my Book of Arches.

## CHAP. XX.

### Of Errours.

HAving ſet down the Ornaments of the Architecture, that is to ſay, the Five Orders, and ſhewed how they are made, and laid down the Profiles of each of their parts, which I found that the Ancients did obſerve; it ſeems to me not unfit here to acquaint the Reader of many abuſes, which being brought in by the barbarous, are yet obſerved; to the end that the ſtudious in this art may avoid them in their own Works, and underſtand them in others.

I ſay then, that Architecture (as all other Arts are) being Imitatrix of Nature, accounts nothing tolerable which is eſtranged, and differs from that which is natural: Wherefore we ſee that thoſe Ancient Architects who built with Timber, when they began to build with Stone, directed that the Columns might be leſs at the top than at the foot, taking example from Trees, which are leſs at the top, than in the Trunk, and near the Root. Likewiſe becauſe it is very convenient that thoſe things upon which any great weight is put ſhould be preſſed, under the Column they put a *Baſe*, which with their *Torus* and *Scotia*, ſeem by the burthen over them to be ſwelled; ſo alſo in the *Cornices*, they bring in the *Triglifes*, *Modiglions*, and the *Dentils*, which ſhould repreſent the heads of the Joices, which in the Cieling are placed to bear up the Roof. The ſame may be obſerved in all other parts, if you are curious: And being ſo, you cannot but blame that form of Building which deviates from that which Nature inſtructeth, and from that ſimplicity which is directed in things by her produced, framing (as it were) another Nature, and departs from the true, good and handſome manner of Buildings; for which reaſon you ought not (inſtead of Columns or *Pillaſters*, which are to bear up ſome great weight) to place *Cartouches*, which are certain Scroles, which to the intelligent ſeem deformed, and to the ignorant rather confuſion than pleaſure, nor do they produce other effects, than increaſe the charge of the builders. Likewiſe you muſt not make any of thoſe *Cartouches* come out of the *Cornice*, for it is requiſite that all the parts of the *Cornice* be made to ſome end, and to make appear what it would be if the work were framed of Timber. And beſides, being it is convenient that to uphold a great weight ſomething ſolid and fit to ſupport that weight be required, queſtionleſs thoſe *Cartouches* are altogether ſuperfluous, becauſe it is impoſſible that any Timber whatever could really perform what theſe ſeem; for feigning it ſelf to be ſoft and gentile, I know not by what rule they put them under any thing heavy and hard. But that which (in my opinion) imports much, is the abuſe in making Frontiſpieces of Doors, Windowes and Galleries, divided in the middle, becauſe they were made to defend the Inhabitants from rain; I know nothing more contrary to natural reaſon, than to divide and open that part which the Ancients, inſtructed by neceſſity it ſelf, did make whole, and raiſed in the middle, to ſhew that it ought to ſerve to defend the Inhabitants of the Houſe, and thoſe that enter therein, from Rain, Snow and Hail. And although Variety and Novelty ſhould pleaſe all, yet we are not to go againſt the precepts of Art, and that which Reaſon demonſtrates; whence we ſee that although the Ancients did vary, yet they never departed from the general and neceſſary Rules of Art, as may be ſeen in my Book of Antiquities: Alſo concerning the projecture of the *Cornice* and other Ornaments, 'tis no ſmall abuſe in making them come too forward, becauſe when they exceed that which according to Reaſon is fit for them, eſpecially if they be in a cloſe place they ſeem narrow, and uncomely, and put fear in thoſe which ſtand underneath, threatning always to fall, you ought as much to avoid making the *Cornice* diſproportionable to the Column, putting great *Cornices* upon little Columns, or upon great Columns little *Cornices*, who doubts but that ſuch a Building will ſeem very ill favoured. Beſides, to make the Columns ſeem to be of ſeveral parts, making rings and wreathings about them, as it were to hold them together, ought as much as may be to be avoided; becauſe how much the more intire and ſtrong the Columns appear, ſo much the more they perform the deſign for which they are placed, which is to render the work above ſecure and firm. Many other like abuſes might be reckoned up, as of ſome members which in the *Cornices* are made diſproportionable to the other, which by what I have ſhewed before, and by that which is now ſaid, may be eaſily known; it remains now to come to the diſpoſing of the particular and principal parts of the Building.

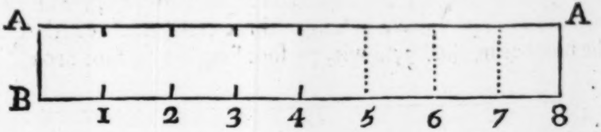
## CHAP. XXI.

## *Of* Galleries, Entries, Halls, Anti-Chambers *and* Chambers, *and of their proportions.*

GAlleries, for the moſt part, are wont to be made on the wings and ſides, or on the front; they ſerve for many accommodations, as Walking, Eating, and other Divertiſements, and they are made bigger or leſſer, according to the greatneſs and conveniency of the Building; but ordinarily, they ought not to have leſs then 16, 18, and 20, foot in breadth, and in great Buildings unto 24, and their length at leaſt five times their breadth, ſix, ſeven, or eight times at moſt.

### *Example.*

Let A A repreſent a *Gallerie*, the breadth whereof is A B; you muſt give it in length five times its breadth unto the number marked 5; or ſix times unto the number 6; or ſeven times unto the number 7; or laſtly, eight times unto the number 8. which is the greateſt length allowed to *Galleries.*



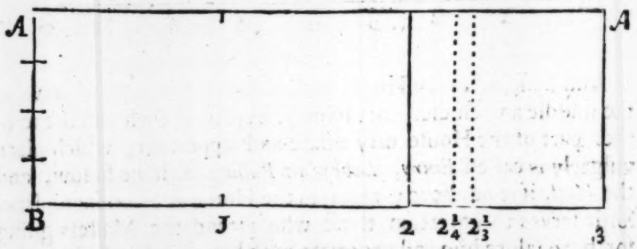
And beſides, every Houſe well compoſed ought to have in the middle and chiefeſt part ſome place, to the which all the other part of the Houſe may relate and appertain; which place vulgarly is called *Entry*, *Lobby*, or *Paſſage* if it be below, and the *Hall*, if it be above; and is in the Houſe as a common place, for it ſerves to entertain thoſe who attend the Maſters going forth, to ſalute him and negotiate with him; and ſuch places are the firſt part of the houſe that preſent themſelves to thoſe that would enter therein. The Halls ſerve for Feaſts, Nuptials and Banquets, to act Comedies, and to take other ſuch like pleaſures and enjoyments; therefore it is, that theſe places ought to be greater than other, and of a Capacious form, to the end that many perſons may commodiouſly be there entertained, and behold what is done.

### *Of the proportion which the Halls ought to have.*

As for my part, I have not been accuſtomed to allow to the length of *Halls* leſs than twice their breadth, or twice and $\frac{1}{4}$. or a third a third part of the breadth at moſt. And to great Buildings you may allow the length to be three times the breadth, whereupon they will be ſo much the more beautiful and convenient.

### *Example.*

Let A A preſent a *Hall*, the breadth whereof is A B, having 24 foot, within the work you may allow the length, twice the breadth unto the number marked 2, to wit, 48 foot in length for 24 foot in breadth, or twice the breadth, and $\frac{1}{4}$, more unto the number marked $2\frac{1}{4}$, to wit, 54 foot long for 24 foot broad, or twice the breadth, and $\frac{1}{3}$ more unto the number marked $2\frac{1}{3}$ to wit, 56 foot long for 24 foot broad; or laſtly, to great Buildings the Hall may have in length three times the breadth, unto the number marked 3, to wit, 72 foot long for 24 foot broad.



The *Anti-Chambers* and *Chambers* ought to be ſo divided, that they may fall on each ſide of the *Entry* and of the *Hall*; and you muſt take heed that thoſe on the right hand may anſwer and be equal to thoſe on the left; to the end, that the building may be on one ſide as on the other, and the walls bear equally the burden of the Roof.

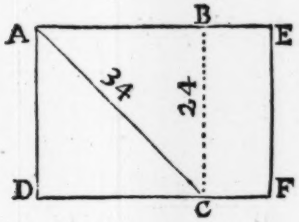
### *Of the proportion of Anti-Chambers.*

A well proportioned *Antichamber* ought to have in length the *Diagonal* line of the ſquare of the breadth, or the breadth and $\frac{1}{2}$ at moſt.

*Example.*

### *Example for the firſt bigneſs of Anti-Chambers.*

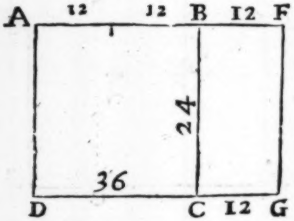
Let A B C D be a ſquare, whereof each ſide is 24 foot, and the *Diagonal* line thereof being drawn A C, the ſame length that the *Diagonal* is of, you muſt give to the ſaid *Anti-Chamber* from A unto E, from D unto F, in this manner.



The *Anti-Chamber* will have 34 foot in length to 24 foot in breadth.

### *Example of the ſecond bigneſs of Anti-Chambers.*

Let A B C D be a ſquare, of which each ſide is 24 foot as before, and to the ſaid A B C D the half their length, to wit, 12 foot from B to F, and ſtom C to G, you ſhall make the *Anti-Chamber*, 36 foot in length to 24 foot in breadth.



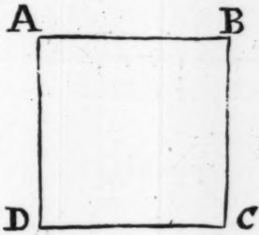
### *Of the proportion of Chambers.*

As for the *Chambers*, you may make therefore five ſorts and proportions; for they are either ſquare, or they may be in length their breadth with an eighth part, a ſeventh, a ſixth, or a fifth part above their breadth.

*Example*

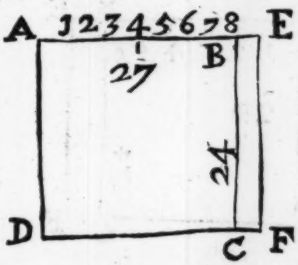
### *Example of the Firſt bigneſs of Chambers.*

Let A B C D be a perfect ſquare, of which the 4. ſides and the 4. Angles may be equal, this ſhall be the bigneſs of the *Chamber*.



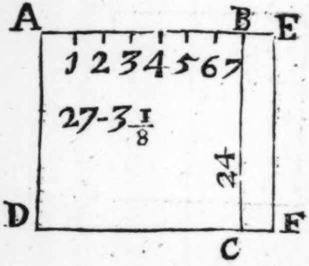
### *Example of the Second.*

Let A B C D be a ſquare, whereof each ſide is 24. foot, you may divide one of the ſaid ſides into 8. equal parts, whereof each may be 3. foot, add one of the ſaid parts to the ſide A B and continue it to E, and as much to the ſide D C, continue it to F and you will make the *Chamber* 27. foot long to the 24. foot broad.



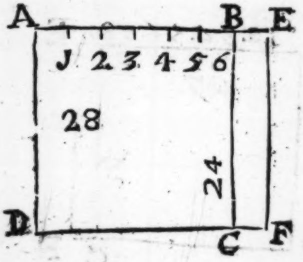
### *Example of the Third.*

Let A B C D be a ſquare, as before, of 24. foot; to each ſide, divide the ſide of A B into ſeven equal parts, add to it one, continuing the ſame to E, and the ſide D C unto F, the ſaid *Chamber* will have 27. foot 5. inches and $\frac{1}{2}$ part in length to 24. foot in breadth,



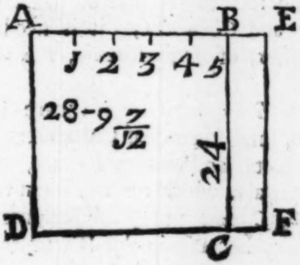
### *Example of the Fourth.*

Let A B C D, as before, be a ſquare, having on each ſide 24. foot; divide one of the ſides, as A B into ſix equal parts, add thereunto one of the ſaid parts, drawing the ſaid ſide unto E, and D C unto F, you will make the *Chamber* 28. foot long to 24. foot broad.



### *Example of the Fifth and laſt bigneſs of Chambers.*

Let the figure A B C D be, as before, each ſide thereof to be 24. foot, divide one of the ſides into five equal parts, add one of the ſaid parts drawing the ſide A B unto E, and D C unto F, you will make the *Chamber* 28. foot 9. inches, and $7\frac{1}{2}$. in length to 24. foot in breadth.



## CHAP. XXII.

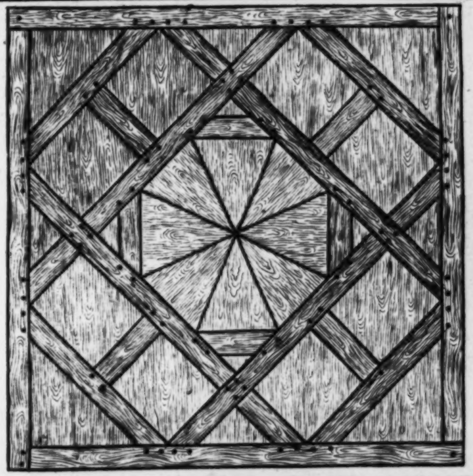
## *Of* Floors *and* Superficies, *of* Departements, Planchers, *and* Flat Seelings.

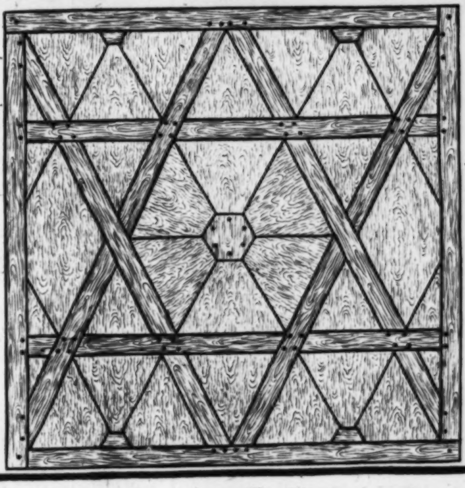
AFter having ſeen the formes of *Galleries*, *Halls*, *Anti-Chambers* and *Chambers*, it is needful to diſcourſe of *Floors* or *Superficies*, of *Departements*, *Planchers*, and *Flat Seelings*.

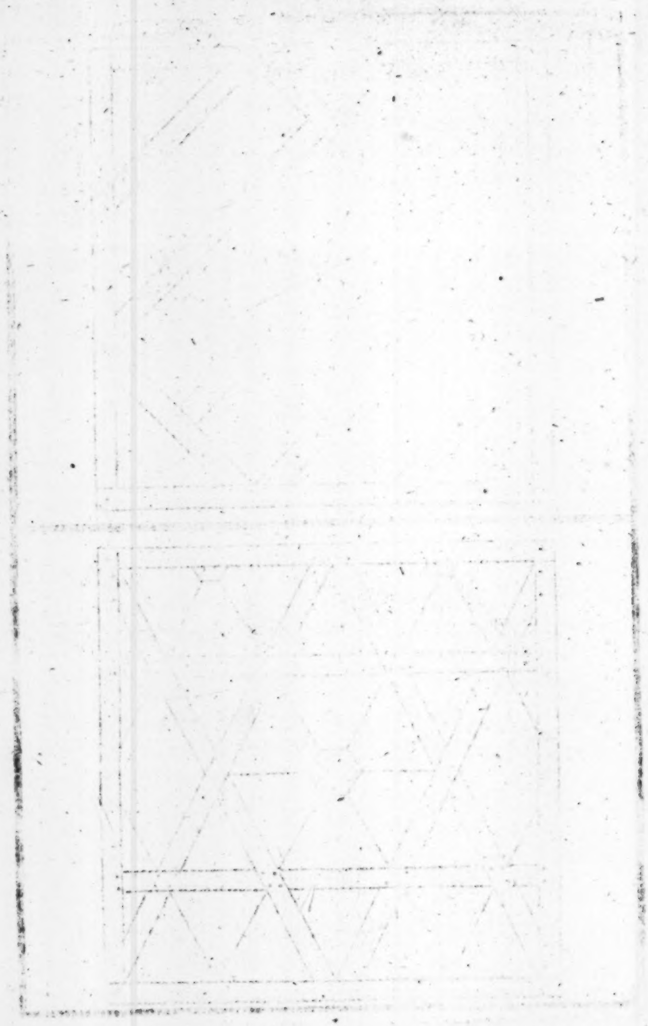
*Floors* or *Superficies*, may be of ſquare Tyles or hard Stone, or of Marble, or ſmall ſquares of Carpenters work, and may be made of divers ſorts, and divers colours, according to the variety of the materials, which renders them very agreeable to the eye: In lodging *Chambers* they are ſeldome made of Marble or other hard Stone, becauſe in the *Winter* they will be too cold; But in *Galleries*, or other publick places, they will agree very well.

*This ſort of* Floors *of ſmall ſquares of Carpenters work, may be ſeen at* Somerſet-Houſe, *of which, being a novelty in* England, *I thought good to preſent the Deſign thereof, although not in my Author.*

You







You muſt take heed that the *Hall*, *Anti-Chambers*, and *Chambers*, which are of the ſame ſtory, may have all the Floors or Pavements equal in ſuch manner, that the threſholds may not be higher then the reſt.

The *Planchers* are alſo made of divers wayes, for ſome there are that take pleaſure to make them very handſome of well wrought Joiſts; where you may take notice that the Joiſts muſt be diſtant the one from the other, the thickneſs of a Joiſt and half, and ſo the ſeeling will be very handſome: And there will be ſo much wall between the ends of the Joiſts, as will be ſufficient to bear up the walls about it; whereas if they ſtand wider one from the other, it will be very ill favoured; and if cloſer, 'twill be as a dividing of the upper wall from the lower; and if the Joiſts rot and be conſumed with fire, the wall of neceſſity muſt be ruined.

Others will have Compartements of Plaiſter, or Wood, inriching them with pictures and gilded work, and beautifie them according to their various humours; wherefore in this there can be given no certain nor determinate rules.

## CHAP. XXIII.

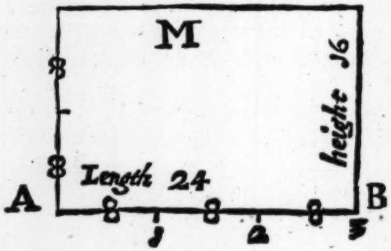
### *Of the height of* Halls, Anti-Chambers, *and* Chambers.

HAlls, *Anti-Chambers*, and *Chambers*, are made either arched or flat: If you make them flat, divide the breadth into three parts, and two of thoſe parts ſhall be the height of the Story, from the floor to the Joiſt.

*Exam-*

### *Example of the firſt height of* Halls, Anti-Chambers, *and* Chambers.

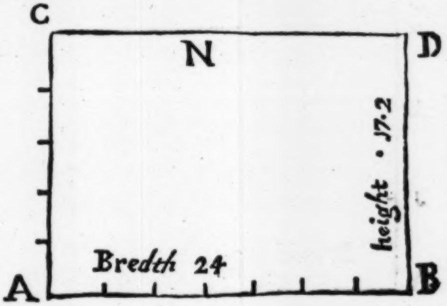
Let the figure M repreſent the Chamber whoſe height you would find, which ſuppoſe to have in breadth 24. foot within the work, which ſhall be divided upon the line A B, into three equal parts with points, where is marked the number 1 2 3. each part being eight foot, two of each parts ſhall be the height of the Chamber, to wit, 16. foot from the Floor to the Joiſt.



And if you would have it higher, the breadth muſt be divided into ſeven parts; take thereof five, which will give the height.

### *Example of the ſecond height.*

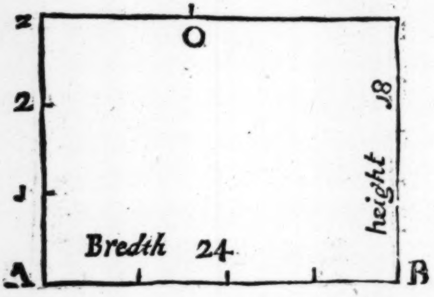
Let the figure *N* be of the ſame breadth as the foregoing, to wit 24. foot within the work, which ſhall be divided upon the line A B into ſeven equal parts, take thereof five to make the height of the Story A C, and B D, the ſaid height will be 17. foot 2. inches, from the Floor unto the Joiſts.



Or divide the ſaid height into 4. parts, and three of thoſe parts will likewiſe give a greater height.

*Example of the third height, yet higher.*

Let the figure O be of the ſame breadth as the former, to wit of 24. foot within the work, which ſhall be divided upon the line A B, into four equal parts, three thereof you muſt take for the height of the Story, ſo it will be of 18. foot from the Floor to the Joiſt.



## CHAP. XXIV.

### *Of the Proportion of the height of* Chambers *of the ſecond Story.*

THE height of *Chambers* of the ſecond Story ſhall be a twelfth part leſs then the *Chambers* below.

*Example of the height of the Second Story in the Figure marked* M.

Be it, as it is ſaid in the Figure marked M, its firſt Story of 16. foot, from the Floor to the Joiſt, divide the ſaid 16. foot into twelve equal parts, take eleven which will make 14. foot 8. inches for the height of the ſecond Story, from the Floor to the Joiſt.

### *Example of the Second Story of the Figure marked* N.

Be it, as it is ſaid in the Figure marked N, its firſt Story of 17. foot 2. inches high, from the Floor to the Joiſt; divide the ſaid 17. foot 2 inches into twelve equal parts, take thereof 11, which will make 15. foot 7. inches, for the height of the ſecond Story from the Floor to the Joiſt.

### *Example of the height of the ſecond Story of the Figure* O.

Be it, as it is ſaid in the Figure O, its firſt Story of 18. foot from the Floor to the Joiſt, divide the ſaid 18. foot into twelve equal parts, take thereof 11, which will make 16. foot and $\frac{1}{2}$ for the height of the ſecond Story from the Floor to the Joiſt.

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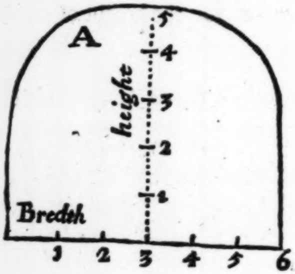
## CHAP. XXV.

## *Of the Proportion of* Halls, Anti-Chambers, *and* Chambers, *of the firſt Story which are Arched.*

IN great Buildings the *Hall*, *Anti-Chambers*, and other Rooms of the firſt Story may be arched, whereupon they will be much more handſome, and leſs ſubject to fire: Their height is made by dividing the breadth into ſix parts, and thereof take five, which will give the height that it ought to have from the Floor or Superficies unto the bottom of the key of the Arch.

## *Example of the firſt height of* Halls, Anti-Chambers, *and* Chambers, *which are Arched.*

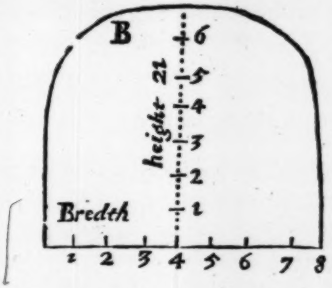
Let the Figure marked A be of 24. foot in breadth more or leſs, and be divided into ſix equal parts ; take thereof five, which will make it 20. foot high, from the Floor unto the bottom of the key of the Arch.



And if you would have one higher, you muſt divide the ſaid breadth into eight parts, and ſeven thereof ſhall be the height.

### *Example of the ſecond height.*

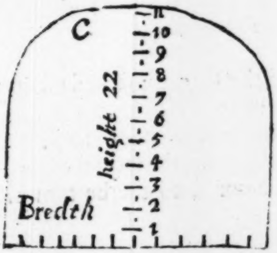
Let the Figure B having the ſame breadth as the former of 24. foot within the work, be divided into eight equal parts, and take thereof ſeven, which will make 21. foot for the height from the Floor unto the bottom of the key of the Arch.



And if you divide the ſame breadth into 12. parts, you muſt take thereof 11. which will make it higher.

### *Example of the third yet higher.*

Let the Figure C be of 24. foot broad within the work, as the former, divide the 24. foot into 12. equal parts, take thereof 11. which make 22. foot in height, from the Floor into the bottom of the key of the Arch.



CHAP.

# CHAP. XXVI.

## *Of the Proportion of the height of* Chambers *of the ſecond Story.*

THE *Chambers* of the ſecond Story muſt be raiſed a ſixth part leſs then the *Chambers* below.

### *Example of the height of the ſecond Story of the Figure marked* A.

Be it, as it is ſaid in the Figure marked A, its firſt Story of 20. foot in height, from the Floor unto the bottom of the key of the Arch, divide the ſaid 20. foot into ſix equal parts, take thereof five which will make the ſecond Story 16. foot eight inches from the Floor to the Joiſt.

### *Example of the height of the ſecond Story of the Figure marked* B.

Be it, as it is ſaid in the Figure B, its firſt Story of twenty and one foot in height, from the Floor unto the bottom of the key of the Arch, divide the ſaid 21. foot into ſix equal parts, take thereof five, which will make the ſecond Story 17. foot. 6. inches in height, from the Floor unto the Joiſt.

### *Example of the height of the ſecond Story of the Figure marked* C.

Be it, as it is ſaid in the Figure marked C, its firſt Story is of 22. foot in height, from the Floor unto the bottom of the key of the Arch, divide the ſaid 22. foot into ſix equal parts, take thereof five which will make the ſecond Story 18. foot 4. inches in height, from the Floor unto the bottom of the key of the Arch.

CHAP.

## CHAP. XXVII.

### *Of the Proportion of the third Story.*

IF you would make above the ſecond Story, an Attique or third Story: The ſecond muſt alwayes be divided into twelve equal parts, nine whereof will give the height of the third Story, from the Floor unto the bottom of the Joiſt.

In the building of *Chambers* you ought to have regard as well to the place of the bed, which is uſually ſix or ſeven foot ſquare, and the paſſage, as well as to the ſituation of the Chimney, which for this conſideration ought not to be placed juſt in the middle, but diſtant from it about two, or two foot and ½, to the end it may make room for the bed, and by this means the inequality is little diſcerned if it be not in buildings, the breadth at leaſt of 24. foot within the work; and in this caſe it may be placed juſt in the middle.

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## CHAP. XXVIII.

### *Of the height of* Galleries.

THE lower *Galleries* muſt be as high as the *Halls*, *Anti-Chambers* and *Chambers* of the firſt Story, ſo the end that one may enter therein on even ground, which is to be underſtood then, when the ſaid lower *Galleries* have the ſame framing, which the ſaid *Halls*, *Anti-Chambers*, and *Chambers*, whoſe Floors ought ordinarily to be raiſed higher then the ground-work of the Court about two foot at leaſt, or of three or four foot; and is aſcended by ſteps, which ought not to have more then ſix inches in height, nor leſs then four, and in breadth one foot, or at the moſt 15. or 16. inches.

But if the *Galleries* be made all open, ſo as they enter into it from the Court; in this caſe you may lay the Floor lower then the neighbouring Rooms, and 'twill ſuffice that the ſaid Floor be one foot higher then the ground work of the Court; thus doing 'twill appear very graceful; for by this means they come near to the fair proportion which they ought to have in their height from the Floor or Superficies unto the bottom of the key of the Arch; and their entrance is by ſteps which are between the opening of the Arches.

## CHAP. XXIX.

### *Of the juſt Proportion which the upper* Galleries *ought to have.*

THE upper *Galleries* are made either flat or Arched, if flat, they muſt be as high as broad: *Galleries* which are arched muſt be as high as broad, with a fifth, fourth, or third part over, and above their ſaid breadth.

## CHAP. XXX.

### *Of the Meaſures of* Doors *and* Windows.

THE certain and determinate Meaſures cannot be given of the height and breadth of principal *Gates* of Buildings: Nor of *Doors* and *Windows* of *Chambers*, becauſe, for to make the principal *Gates*, the Architect muſt accommodate them to the greatneſs of the Building, and the quality of the Maſter, and the uſe that is to be made of them; nevertheleſs he will not omit to give the Meaſures following.

## CHAP. XXXI.

### *Of the Proportion of Principal* Gates.

PRincipal *Gates* of Entrance where Coaches and Wagons ought to paſs, and other ſuch neceſſaries, muſt not have leſs then ſeven and $\frac{1}{2}$, eight, or nine foot: And to great Buildings, unto ten or twelve foot in breadth.

Their height muſt be their breadth and half at leaſt; and to have it well proportioned, you muſt give it in height twice their breadth.

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## CHAP. XXXII.

### *Of the Proportion of* Inner-Doores.

D*Oores* within the Houſe in the leaſt Building, ought not to have leſs then two foot and $\frac{1}{2}$ in breadth, and five foot and $\frac{1}{2}$ in height: Thoſe from three to four foot broad muſt have in height twice their breadth; and to great Buildings you may allow even to five or ſix foot in breadth, and the height double, and ſometimes a fifth or fourth part leſs then their breadth.

The Ancients were wont to make their *Doores* narrower above then below, as may be ſeen in a Church which is at *Tivoli*, which *Vitruvius* teacheth; and 'tis likely they did ſo, to give them more force.

## CHAP. XXXIII.

### *Of the Proportion of* Windowes.

THE Appertures of *Windowes* muſt have four foot and ½ or five foot, and to great Buildings unto ſix; between the two Jaumes their height muſt be at leaſt double their breadth; and to make them comely and well proportioned, a fourth part, a third, or a half part more then the breadth: And according to the bigneſs of theſe, you may make all the reſt in the other Rooms of the ſame Story; but thoſe of the ſecond Story ought to be lower by one twelfth part then thoſe of the firſt; and if you make *Windowes* above them, you ought to make them a fourth part lower then thoſe in the ſecond.

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## CHAP. XXXIV.

### *Of the Proportion of* Soiles *of* Windowes.

THE *Soiles* of *Windowes* muſt have two foot eight inches, unto three foot at moſt in height. The *Tranſoms*, or croſs pieces of *Windowes*, muſt be four or five inches thick; their *Rebates* muſt be from one inch and ½ unto two inches at moſt, to the end they may have greater ſtrength, and that the frames of wood which carry the ſhutters may have convenient ſtrength. The Jaumes of *Windowes* muſt be much rebated, and let in from two inches and ½ to three inches at leaſt, to the end that the wooden frames may be ſtrong, and join to the wall; when the wall is thin, the ſhutters of the *Windowes* ought to ſhut over the rebates the half or one third only; alſo it is needful to divide the ſaid ſhutters, that they may not be a hindrance to the Chamber, nor obſcure the light.

CHAP.

# CHAP. XXXV.

## *Rules to be obſerved in making* Doores *and* Windowes.

IN making *Windowes* you are to take heed that you do not give them more or leſs light then is neceſſary, nor make them wider or narrower then is needful; wherefore you ought to have regard to the greatneſs of the places, which ought to receive the light, it being evident that a great Room hath need of more light then a little one; ſo that if the *Windowes* be made leſs then they ought to be, the place will be obſcure and dark. And becauſe in Houſes ſome *Chambers* are made large, ſome indifferent, ſome little, you muſt take great care that all the *Windowes* may be equal one with the other in their rank and Order, ſo that thoſe on the right hand may anſwer thoſe on the left, and thoſe above may be right over thoſe below. Likewiſe the *Doores* muſt be right over one another, to the end that the void may be upon the void, and the full upon the full: And moreover, let the *Doors* be placed in ſuch manner, that one may ſee from one end of the Houſe to the other, which is very graceful: And beſides, 'tis cool in Summer, and hath many other conveniencies.

It is very ſecure to turn *Arches* over *Doores* and *Windowes*, which *Arches* do diſcharge and hinder that the *Doores* and *Windowes* be not preſſed with too much waight, which is of great importance for the laſting of Buildings.

The *Windowes* muſt be conveniently diſtant from the Corners and Angles of the Building, becauſe that part ought not to be open and infeebled, whoſe office is to ſupport and faſten all the reſt of the Building.

## CHAP. XXXVI.

### *Of the juſt Proportion which the* Pillaſters *of* Doores *and* Windowes *ought to have in thickneſs and Projecture.*

PIllaſters of *Doores* and *Windowes* ought not to be thicker then the fifth part of their Apperture, nor leſs then a ſixth.

The *Projecture* of *Pillaſters* in general is found by dividing their thickneſs into ſix parts, and one of thoſe parts muſt be the *Projecture* they ought to have.

It remains to ſee their Ornaments.

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## CHAP. XXXVII.

### *Of the Ornaments of* Doores *and* Windowes.

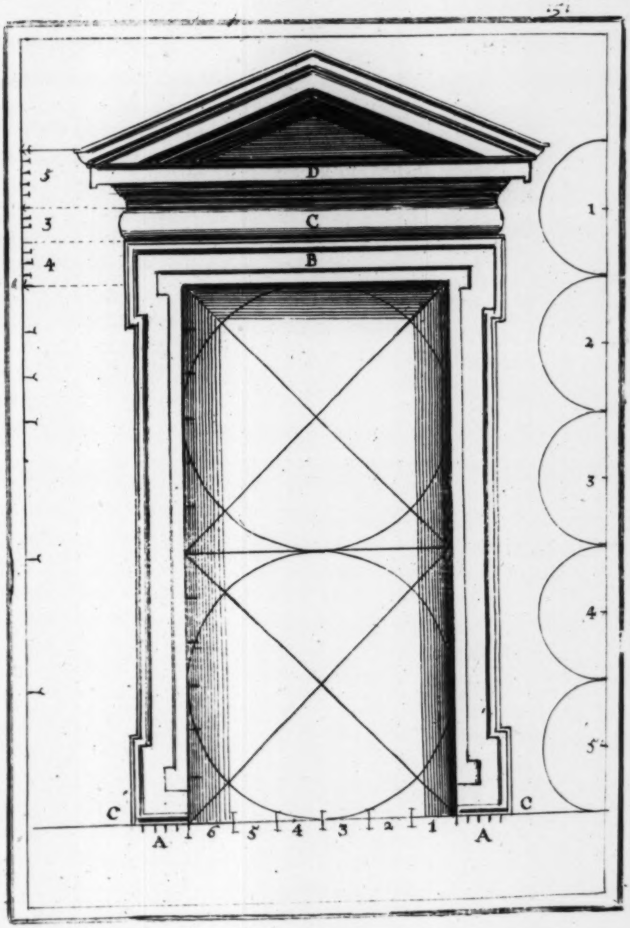
HOW to adorn the *Windowes* and principal *Doores* in Buildings, may eaſily be known from that which *Vitruvius* teacheth in the ſixth Chapter of his fourth Book, adding thereunto all that the moſt Reverend *Daniel Barbero* hath ſaid thereof, and ſhewn in deſign: And alſo of that which I have ſaid before of all the five Orders; therefore leaving that, I ſhall only put ſome deſignes of the Ornaments of *Doores* and *Windowes* of *Chambers*, ſo as they may be made divers wayes; and I ſhall mark particularly every member which is graceful, and how much *Projecture* is needful.

The Ornaments which are given to *Doores* and *Windowes*, are the *Archetrave*, *Frize*, and *Cornice*.

The *Archetrave* turns about the *Doore*, and ought to be as thick as the *Pillaſter*, which (as I have ſaid) ought not to be leſs then the ſixth part of the Apperture, nor more then a fifth ; and from the *Archetrave*, the *Frize*, and *Cornice*, take their thickneſs according to the two inventions which follow.

### *Example.*

Let the breadth of the Apperture of the *Doore* A A. be divided into ſix equal parts, one of theſe parts ſhall be the *Archetrave* B, which winds about the *Doore*, and muſt be divided into four parts, of three thereof is made the height of the *Frize* C, and of five, that of the *Cornice* D.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The Meaſures of each member of the Ornaments may be found in this manner.

The *Archetrave* B, muſt be divided into ten parts, three muſt be for the *Prima Faſcia* G, for four the ſecond V; and the three which remains muſt be divided into 5. three for the *Scima Reverſa* P, and the other two for the *Orlo*, or *Regula* R, whoſe *Projecture* is the fourth part of its thickneſs; the *Scima Reverſa* P, hath in *Projecture* its height, and is marked in this manner: They draw a ſtrait line which terminates at the end thereof, under the *Orlo* or *Regula* R, and on the ſecond *Faſcia* V, and is divided in half, ſo as each of theſe halfes is the Baſe of a Triangle of two equal ſides; and on the Angle oppoſed to the Baſe muſt be placed the fixt foot of the *Compaſs*, and the *Curve lines* muſt be drawn, which make the ſaid *Scima Reverſa* P.

The *Frize* is three parts of four of the *Archetrave*, divided into four, and is deſigned of a portion of a *circle* leſs then the *ſemicircle*, the ſwelling whereof comes directly over the *Cimarium* of the *Archetrave*.

The five parts which are given to the *Cornice*, diſtribute themſelves in this manner to its members: One to the *Scotia* with its *Liſtella*, which is a fifth part of the ſaid *Scotia*.

The *Scotia* hath in *Projecture* two thirds of its height; to deſign it they form a Triangle of two equal ſides, and to the Angle G they place the Centre, and ſo the *Scotia* becomes the Baſe of the Triangle; another of the ſaid five parts is for the *Ouolo*, and hath in *Projecture* the two thirds of its height, and is deſigned making a Triangle of two equal ſides, and the Centre is made at the point H; the other three parts are divided again into ſeventeen, eight for the *Coronna* with its *Liſts*, of which that above makes one of the eight parts; and that which is below and makes the hollow of the *Coronna*, makes one of the ſix parts of the *Ouolo*: The other nine are for the *Scima Recta*, and its *Orlo* or *Regula*, which is a third of the ſaid *Scima*. To frame it ſo as may be well and graceful, they draw the right line A B, and 'tis divided into two equal parts: At the point C, one of thoſe parts is divided into ſeven, whereof ſix are taken at the point D; then they form two Triangles, A E C, and C B F, and on the points E and F, they put the fixt foot of the Compaſs, and draw the portions of the Circles A C and C B, which make the ſaid *Scima.*

The *Archetrave* likewiſe, in the ſecond invention, is divided into four parts; of three is made the height of the *Frize*, of five that of the *Cornice*, then the *Archetrave* is divided into three parts, two of them are divided again into ſeven, of which ſeven, three are the firſt *Faſcia*, and four for the ſecond; and the third part of the *Archetrave* is divided again into nine parts; of two is made the *Aſtragal*, the other ſeven are divided into five parts; three are the *Scima Reverſa*, and two the *Orlo* or *Regula*.

The height of the *Cornice* is divided into five parts and ½, one of which is divided again into ſix parts, of five is made the *Scima Reverſa* above the *Frize*, and of the ſix the *Liſtella*; the *Scima Reverſa* hath as much *Projecture* as it is high, and the ſame alſo hath the *Liſtella*; the ſecond part of the height of the *Cornice* is for the *Ouolo*, which hath in *Projecture* ½ of its height. The Moulding above the *Ouolo*, is the ſixth part of the *Ouolo*, and hath the ſame *Projecture*; the other three parts of the height of the ſaid *Cornice* are divided into 17. parts, eight of which are for the *Coronna*, which hath in projecture three parts of four of its height, the other nine are divided into four parts, three are for the *Cimatium*, and one for the *Orlo* or *Liſtella*; the ½ which remain are divided into five parts and ½; of one is made the Moulding, and of four and ½ the *Scima Reverſa* above the *Coronna*: The ſaid *Cornice* hath as much *Projecture* as it hath thickneſs.

Members of the *Cornice* of the firſt Invention.

I. *Scotia.*

K. *Ouolo.*

L. *Coronna.*

N. *Cimatium.*

O. *Orlo, or Regula.*

Members of the *Archetrave.*

G. *Prima Faſcia.*

V. *Secunda Faſcia.*

P. *Scima Reverſa.*

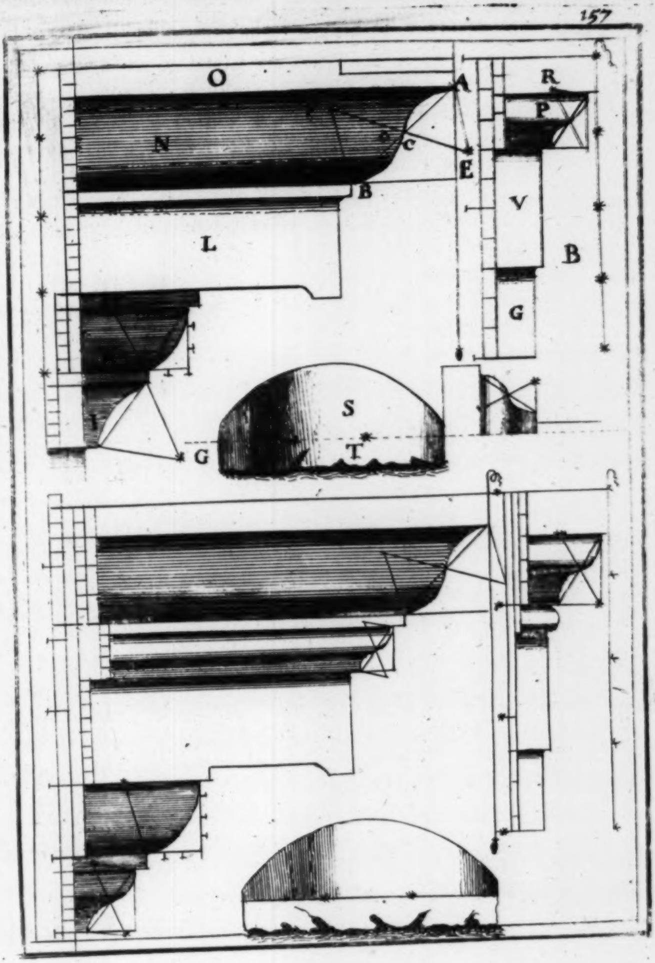
R. *Orlo, or Regula.*

S. *Swelling of the Frize.*

T. *Part of the Frize which enter into the Wall.*

By the means of theſe two, you may know the members of the ſecond Invention.

Of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Of theſe two other Inventions, the *Archetrave* of the firſt which is marked F, is likewiſe divided into four parts, of three and ¼ is made the height of the *Frize*, and of five that of the *Cornice*; the *Archetrave* is divided into eight parts, five are for the plain of the *Archetrave*, and three are for the *Cimatium*, which is divided again into eight parts; three for the *Scima Reverſa*, three for the *Scotia*, and two for the *Ouolo* or *Regula*; the height of the *Cornice* is divided into ſix parts, of two is made the *Scima Recta*, with its *Orlo* or *Regula*, and of another the *Scima Reverſa*; the ſaid *Scima Recta* is divided again into nine parts, of eight thereof are made the *Coronna* and the moulding; the *Aſtragal*, or *Rondeau* above the *Frize*, is a third of one of the ſaid ſix parts, and that which remains between the *Coronna* and the *Aſtragal*, is left for the *Scotia*.

In the other Invention the *Archetrave* makred H; is divided into four parts, and of three and ½ is made the height of the *Frize*, and five the height of the *Cornice*: The *Archetrave* is divided into eight parts, five of them are for the plain of the *Archetrave*, and three are for the *Cimatium*, which is divided into ſeven parts, of one is made the *Aſtragal*, and the reſt are divided into eight parts; three of which are for the *Scima Reverſa*, three for the *Scotia*, and two for the *Orlo* or *Regula*; the height of the *Cornice* is divided into ſix parts and ¾, of three are made the *Scima Reverſa*. The *Dentells* and *Ouolo*, the *Scima Reverſa*, hath as much *Projecture* as it is thick: The *Dentells* are two of three parts of their height, and the *Ouolo* three of four parts. Of the ¾ is made the *Scima Reverſa*, between the *Scima Recta* and the *Coronna*; and the three other parts are divided into ſeventeen, nine make the *Scima Recta*, and the *Orlo* or *Regula*, and eight the *Coronna*.

This *Cornice* hath much as *Projecture* as it hath thickneſs, as all the other aforeſaid.

Here follows deſignes of Doores and Windowes according to the five Orders of *Andrea Palladio*, and are the ſame which are in the *Louvre* in *Paris*.

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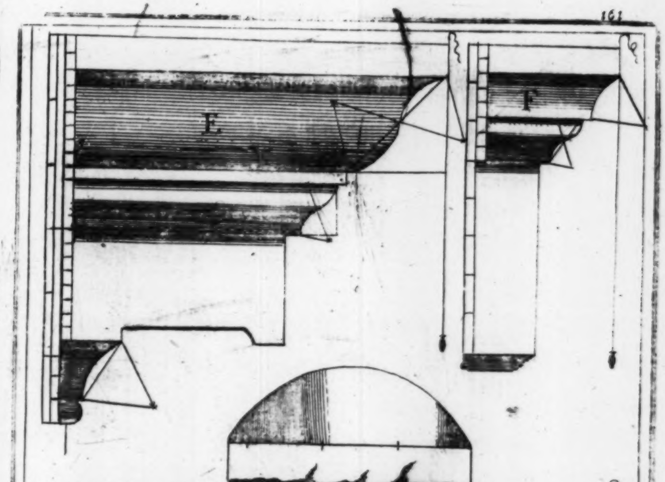
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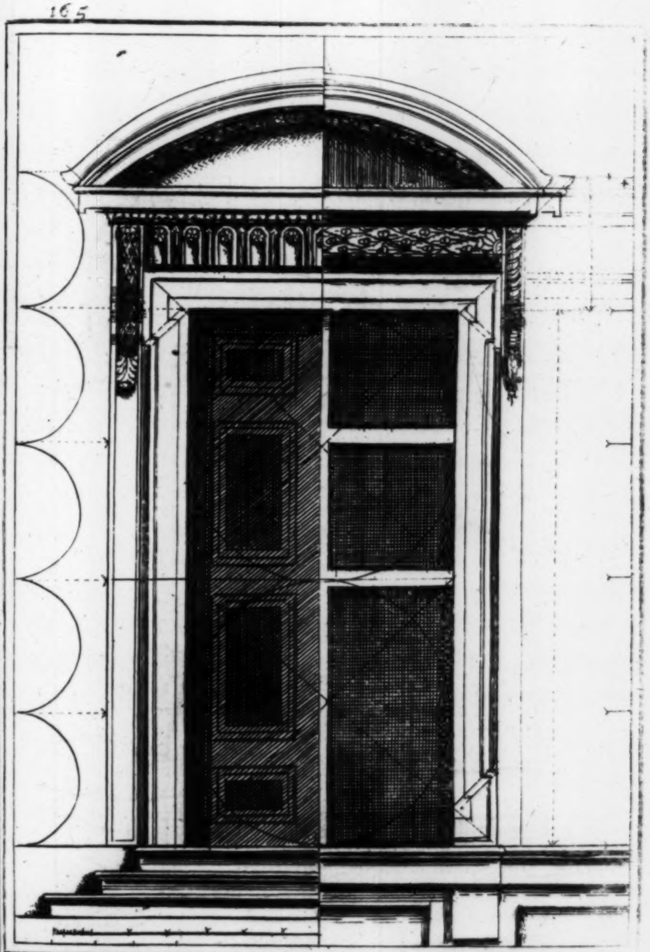
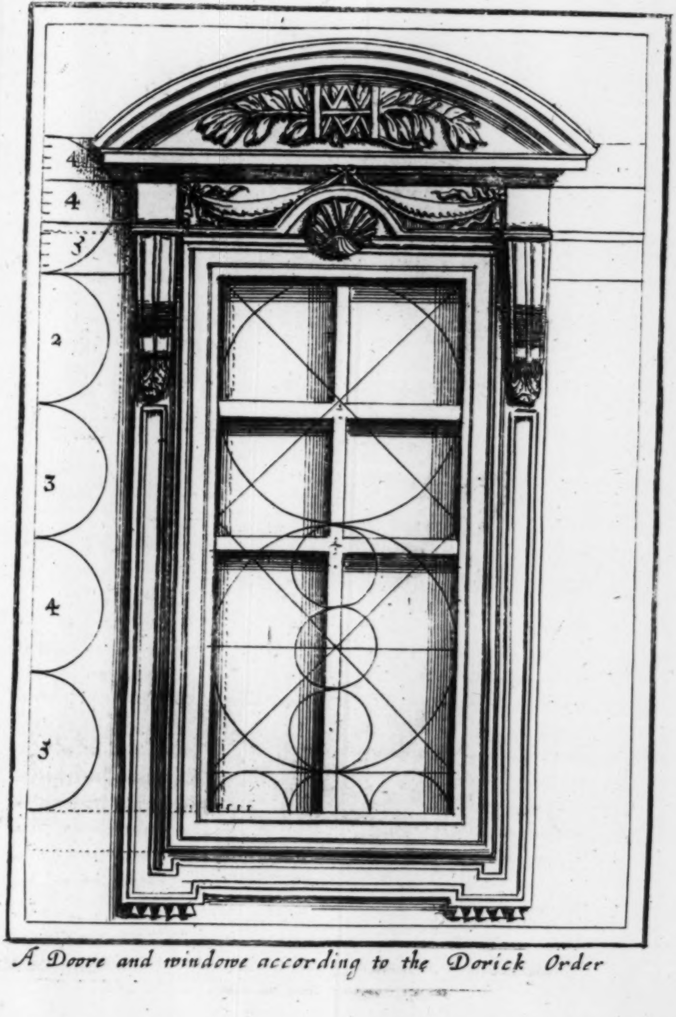
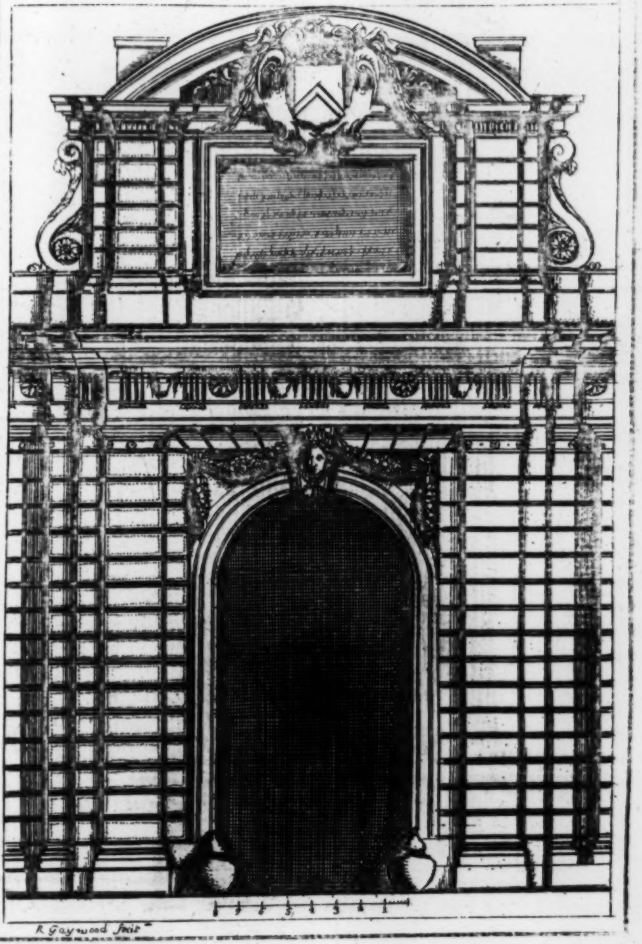


A Doore and windowe according to the Tuscan Order



A Doore and windowe according to the Dorick Order



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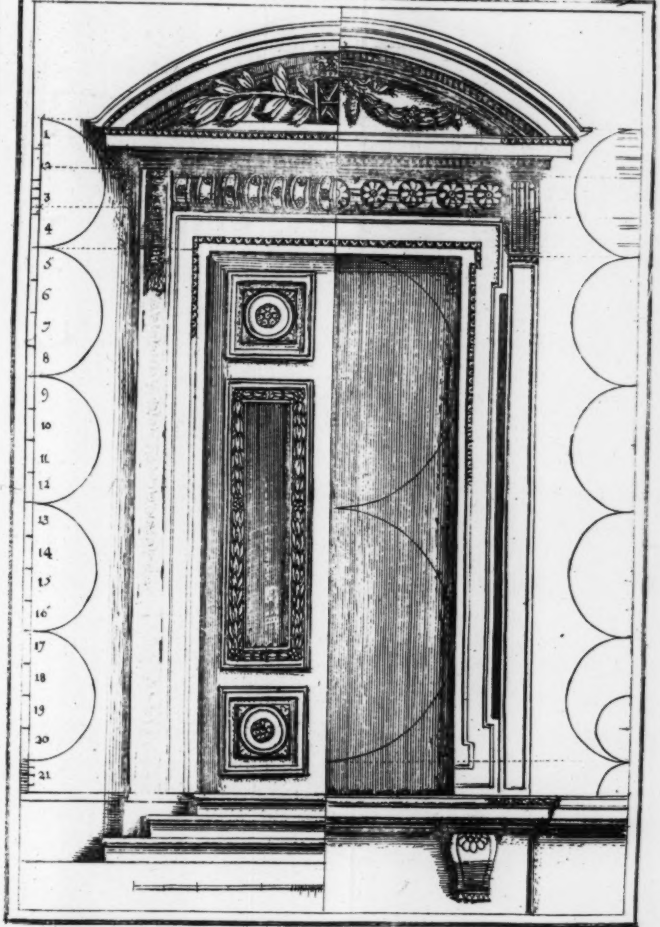
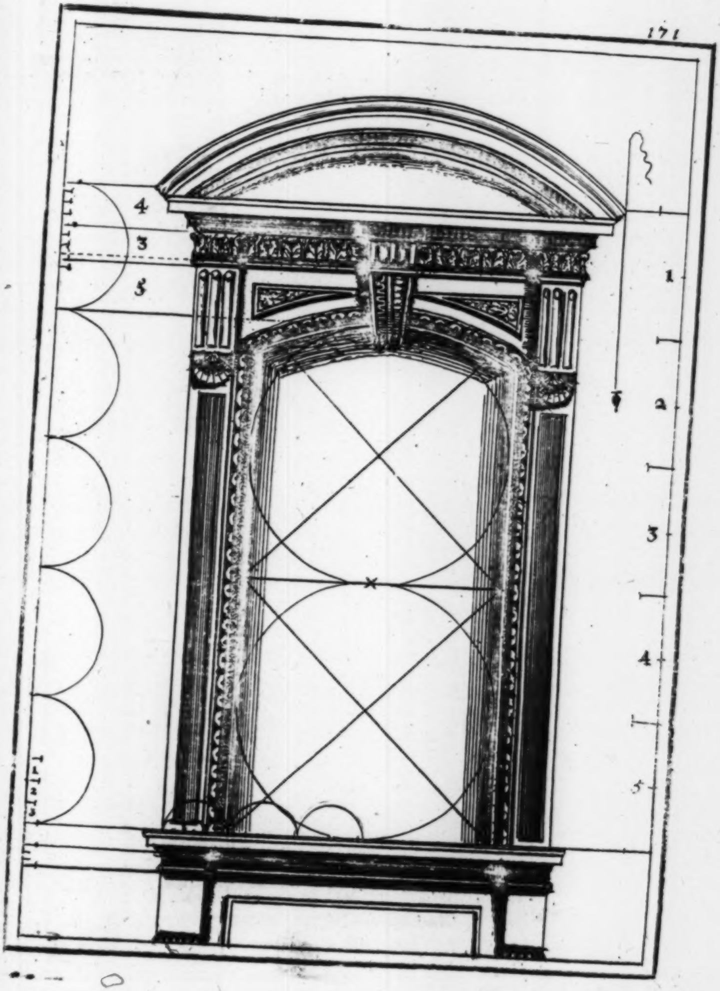
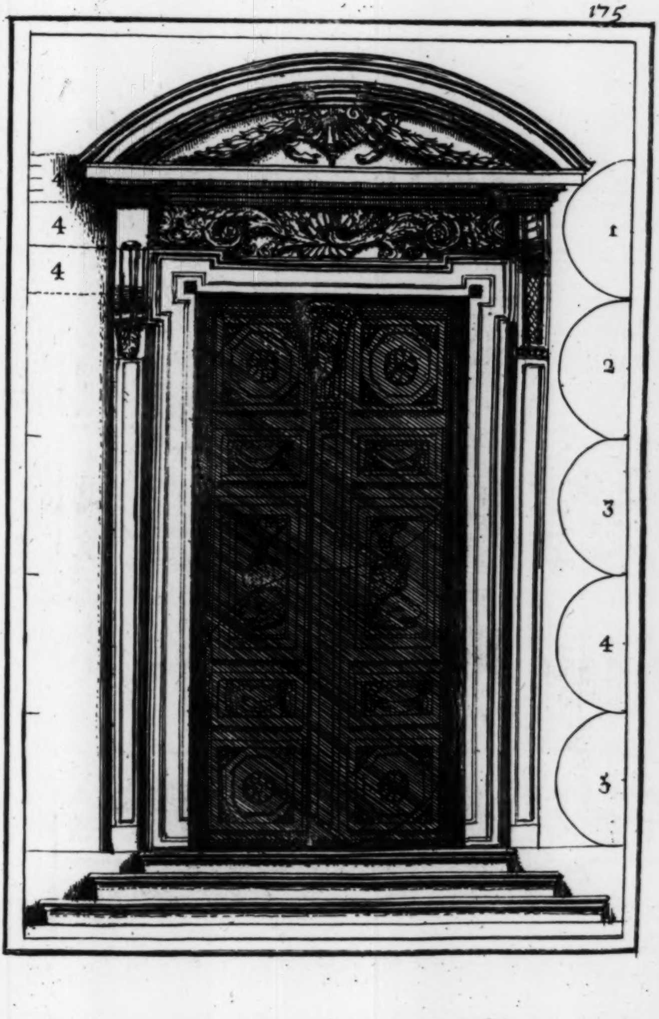
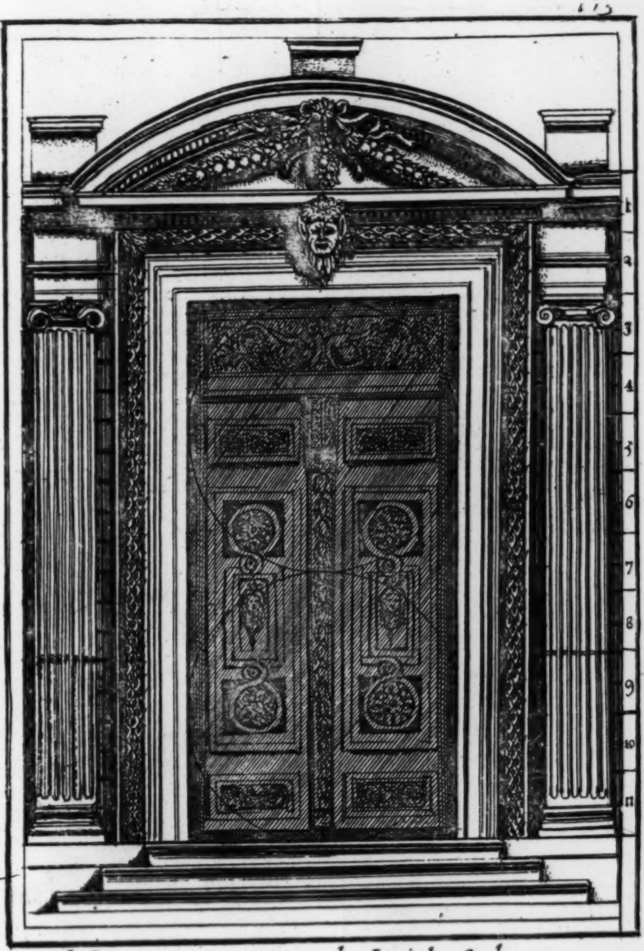


A Doore and windowe according to the Dorick Order







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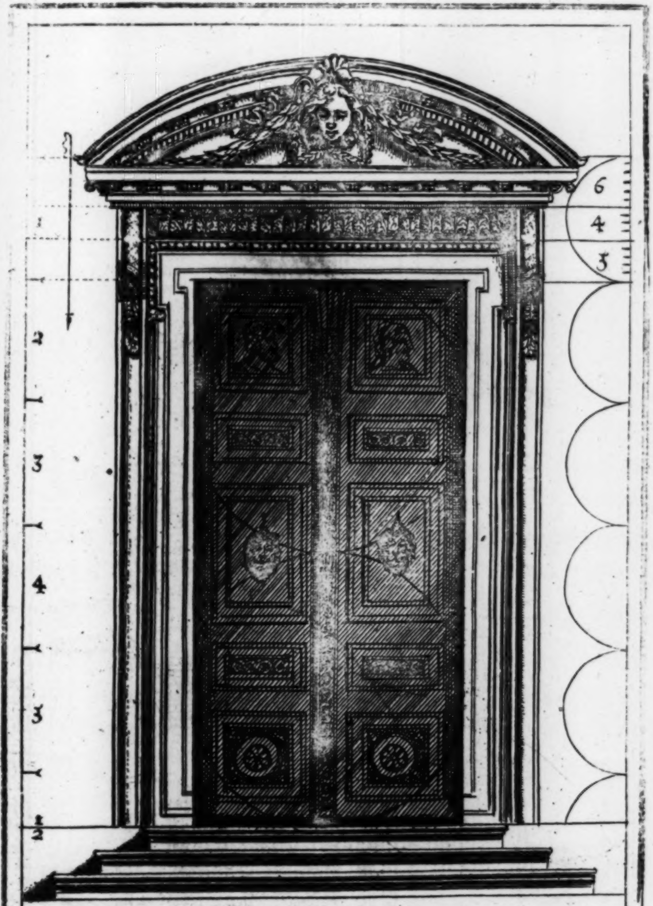
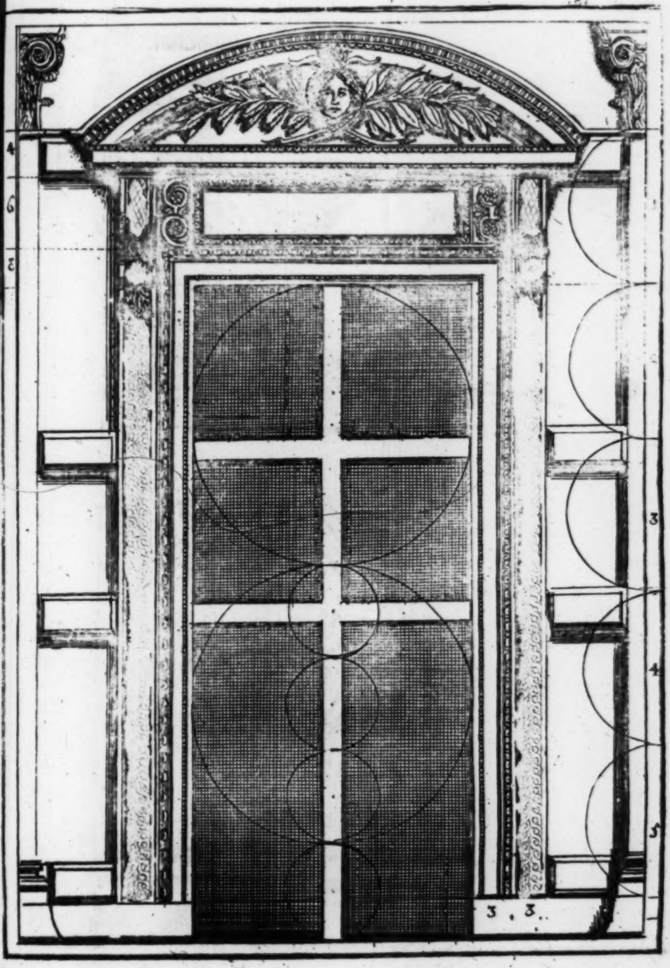


A Doore according to the Corinthian Order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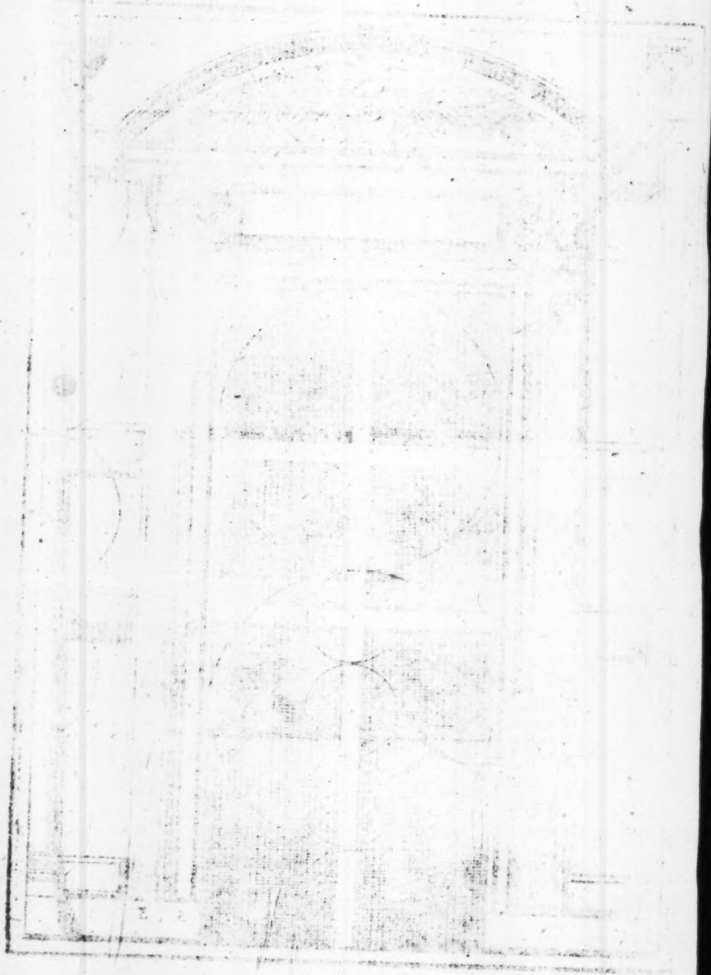

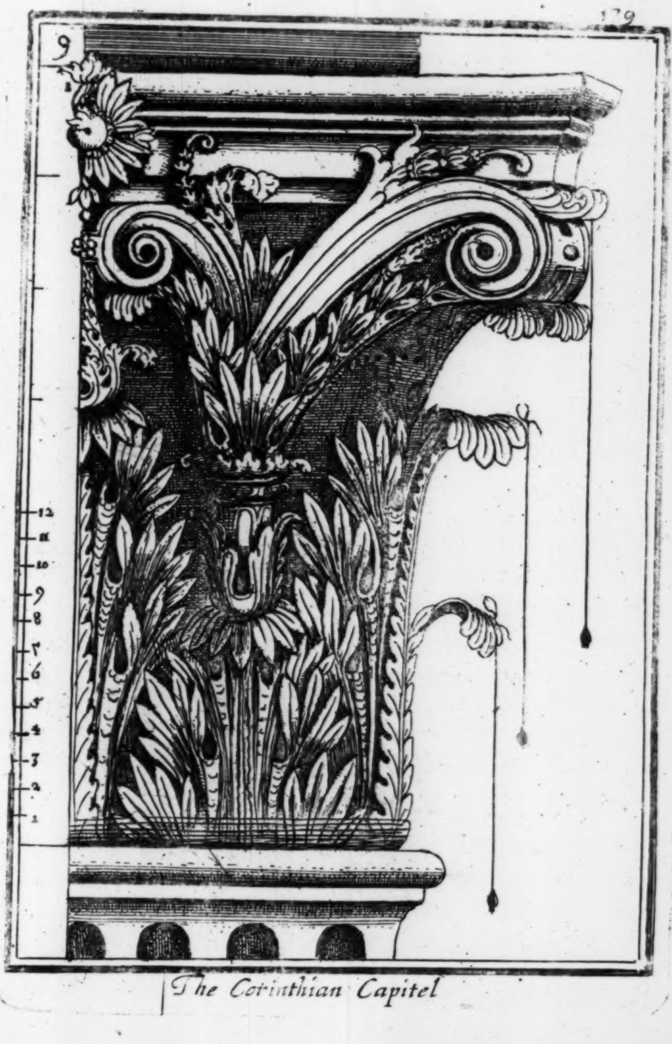

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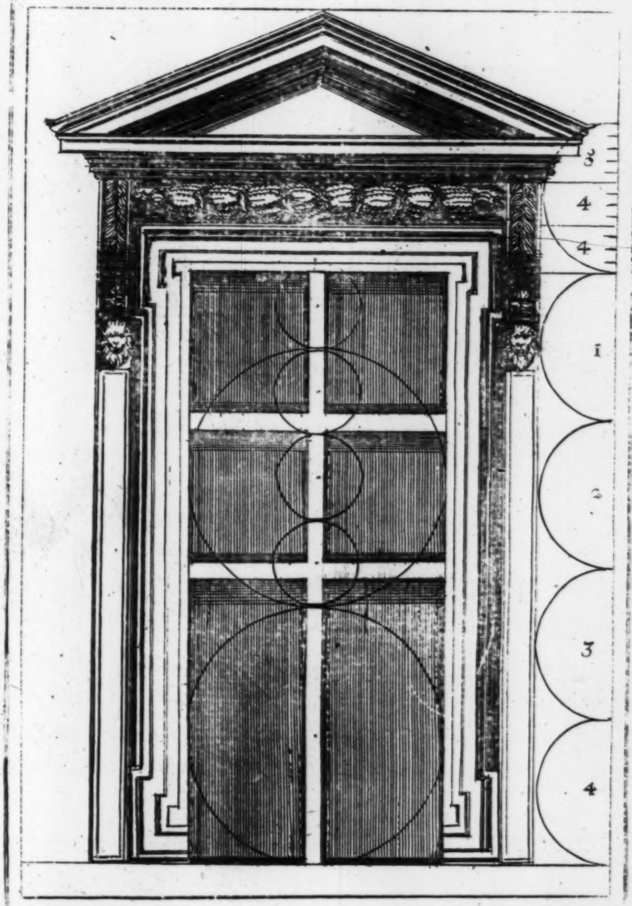

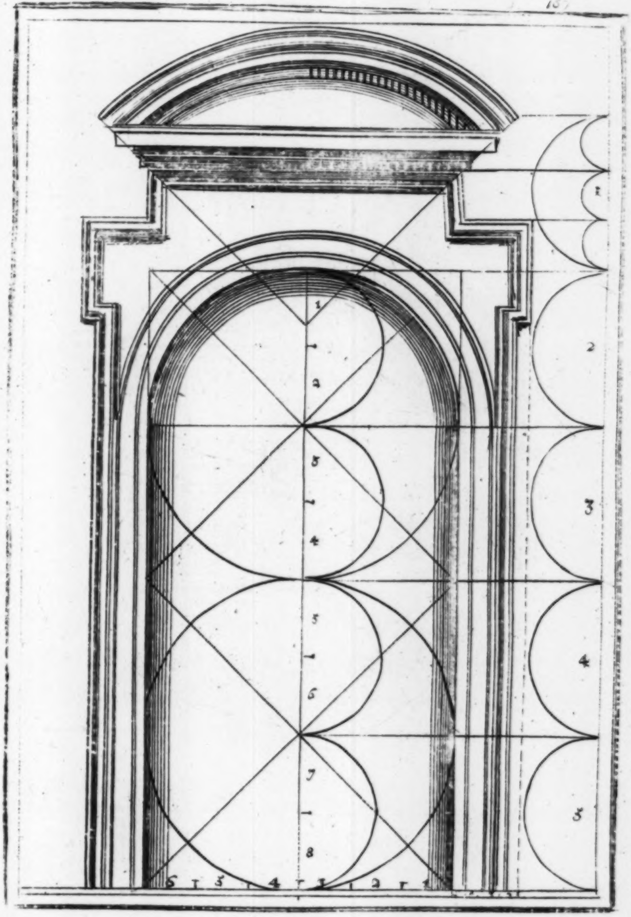
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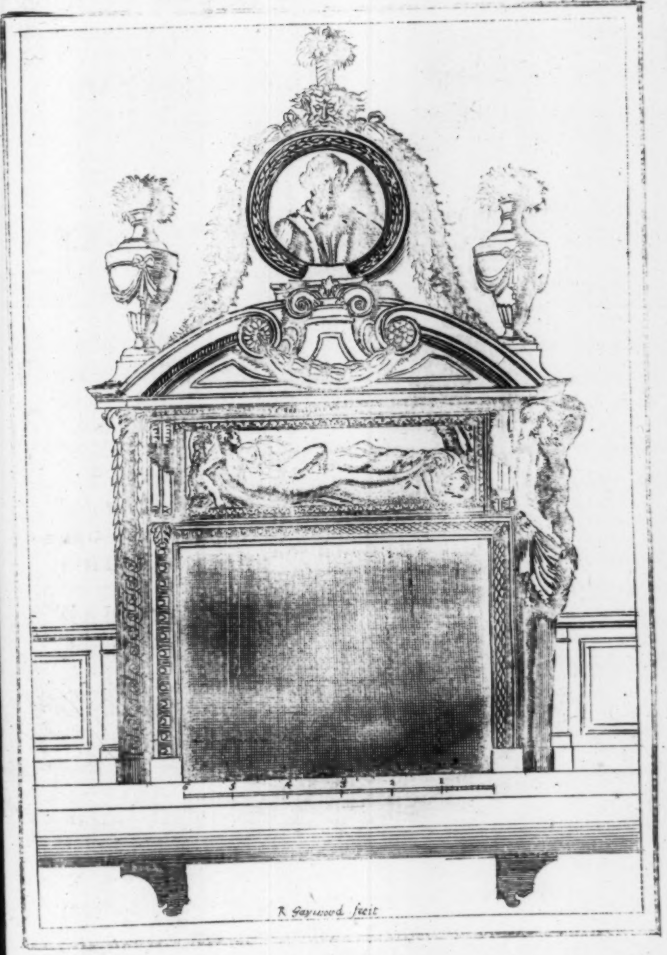
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## CHAP. XXXVIII.

### *Of* Chimnies *in* Halls, Chambers, Studies, *and* Wardrobes, *and of their Proportions.*

H*All-Chimnies* ought to be within work ſix or ſeven foot, and in great Buildings unto eight, between the two Jaumes; and 'twill be convenient to make their *Funnels* in the thickneſs of the wall, if poſſibly it can be; if not, they muſt be ſet in a place where they may correſpond to thoſe of the *Chambers*, the which ſpreads it ſelf but little in the middle, as it hath been ſaid; and if it be poſſible, it muſt be ſo diſpoſed, that the *Chimney* be ſeen in the front by them that ſhall enter into the *Hall.*

Their height muſt be four foot and $\frac{1}{2}$ to five at moſt, from the bottom of the Plate-band to the Mantle-tree; they muſt project two foot and half, or three foot at moſt, from the wall unto the mantle-tree. The Jaumes muſt be from eight to twelve inches in breadth: And in great Buildings even to 24, or more, according to that Order of *Architecture*, with which they are to be adorned.

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## CHAP. XXXIX.

### *Of* Chamber-Chimnies, *and of their Proportions.*

C*Hamber-Chimnies* muſt have in breadth five and $\frac{1}{2}$ or ſix foot, and in great Buildings unto ſeven, and muſt be placed as I have ſaid before, becauſe of the place of the bed. Their height muſt be four foot, or four and $\frac{1}{2}$ from the Mantle-tree or

Plate-band, their *Projecture* muſt be two foot, or two and ½ from the back to the fore-ſides of the Jaumes.

## CHAP. XL.

### *Of the* Chimnies *in* Studies *and* Wardrobes.

C*Himnies* in theſe Rooms muſt be four foot, four and ½ or five foot at moſt in breadth : Their height from the Mantle-tree muſt be like to that above of four foot, and ½, and alſo their *Projecture* two foot, or two and ½ from the back.

## CHAP. XLI.

### *Of* Funnels *of* Chimnies.

F*Unnels* of *Chimnies* muſt be carried thorow the Roof, and above the ridge, three foot, four or five foot at moſt, that they may carry the ſmoak into the Air. You muſt take care that they be made neither too wide nor too narrow; for if they be too wide, the wind will drive back the ſmoak into the Room, and will not permit it freely to aſcend and paſs forth ; and in *Funnels* too narrow, the ſmoak not having free paſſage is repulſed, and returns backwards : Therefore 'tis that *Chamber-Chimnies* are not made narrower then ten or eleven inches, nor broader then fifteen, which is the ordinary depth of *Funnels* of great Kitchin Chimnies, by reaſon of the great fire that is made therein ; and for their breadth, they muſt be four or five foot at moſt within the work, from the place where the breſt ends unto the top of the *Funnel*; now the ſaid breſt reacheth from the Mantle-tree unto the Sieling or pitch of the Arch, alwayes diminiſhing within the work, until you come to the meaſures of depth and breadth before mentioned : and from thence ariſing unto the end of the *Funnel*, it muſt be carried up as even as you can poſſibly ; for failing in this, it often happens the ſmoak is offenſive.

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# CHAP. XLII.

## *What is to be obſerved in making* Chimnies, *and the faſhion which was practiſed among the Ancients.*

THE *Jaumes* and *Mantle-trees* of *Chimnies* muſt be curiouſly wrought ; for ruſtick work doth not appear well, unleſs it be in very great Buildings, for the Reaſons aforeſaid.

The Ancients, to heat their Chambers, did ſerve themſelves in this manner : They made their *Chimnies* in the middle, with Columns or *Corbeaux* which bore up the *Archetrave*, upon which were the *Funnels* of the *Chimnies* which conveyed away the ſmoak ; of which kind one may be ſeen at *Bay* near the *Piſcine* of *Nero*, and one which is not far from *Civita Vecchia* ; and when they would not have *Chimnies*, they made in the thickneſs of the wall pipes or funnels, thorow which aſcended the heat of the fire which was under the *Chamber*, and was conveighed forth through certain vents and conducts which was on the top of the funnels. Much like this, the *Trenti* Gentlemen of *Venice* in the Summer refreſhed their *Chambers* at *Coſtoza*, their Country dwelling : For in that place there are great Mountains in which are certain great Caves, which in times paſt were Quarries, which ( I ſuppoſe ) *Vitruvius* means in his ſecond Book, where he treats of Stone. In theſe Caves are ingendred extream cool winds, which theſe Gentlemen cauſed to be brought into their Houſe, through certain *Subterranean* vaults ; and by the means of certain truncks, like to thoſe whereof I have ſpoken before, make them to run thorow all the *Chambers*, opening and ſhutting them at pleaſure to take more or leſs of Air, according to the time and ſeaſon ; and this place would be wonderful were it only for this great Commodity, nevertheleſs that which renders it yet more admirable and worthy to be ſeen in the priſon of the wind, which is a certain *Chamber* under ground, made by the moſt Noble *Seignieur Trenti*, and by him called *Æola* ; where many of thoſe trunks and conducts of wind are diſcharged ; and to render it beautiful, and worthy of this name he hath given it, he hath ſpared neither care nor charge.

## CHAP. XLIII.

### Of Stair-Caſes, *and their divers manners, and the numbers and greatneſs of their* Steps

THere ought to be great care taken in the well placing the *Stair-Caſe* ; for there is not a little difficulty to find a place convenient, ſo as the *Stairs* may be diſtributed without prejudice or hindrance to the reſt of the Building ; 'tis therefore that ordinarily they are placed in the corner of the Building, or on the wings, or in the middle of the front, which is but ſeldom, unleſs it be in great Buildings ; becauſe much of the Stone-work will be hindred by reaſon of the *Stairs* being in the middle, unleſs the Houſe be double.

There are three openings neceſſary to the leaſt *Stair-Caſe*, the firſt is the door-way that leads to them, which is the better when it is ſpacious, and pleaſeth me moſt if it be in ſuch a place where, before one approacheth, one may ſee the beſt part of the Houſe : For although the Houſe be little, by this means it appeareth much larger ; nevertheleſs it behoves that the ſaid *Door-way* be obvious and eaſie to be found.

The ſecond opening is that of the *Windows*, which are needful to give light to the *Stairs*, and when there is but one, let it be in the middle as near as you can, to the end that all the *Stair-Caſe* may be inlightned.

The third opening is the landing place, by which we are to enter into the Rooms above, and ought to lead to places large, fair, and well adorned.

*Stairs* will be well made, if they be ſpacious, light, and eaſie, ſo as they may invite people to go up.

They will be lightſome when they have a perfect light, that diſperſeth it ſelf to all parts equally.

They are ſpacious when they appear not little, nor narrow in reſpect of the bigneſs and quality of the Fabrick; but they muſt never be narrower then four foot; to the end, that if two perſons meet, they may commodiouſly paſs one by the other; they may be made of five or ſix foot, or ſeven and half, and to great Buildings unto ten or twelve foot broad to every flight, and they muſt be made as commodious as poſſibly you can.

## CHAP. XLIV.

## *Of the Height and Breadth of* Steps.

THE *Steps* ought not to be more then ſix inches high; and if they be lower, they muſt chiefly be to long and continued *Stairs*; they will be ſo much the eaſier, becauſe one needs not lift the foot ſo high; but they muſt never be lower then four inches.

Their breadth ought not to be leſs then a foot, nor more then fifteen or ſixteen inches.

The Ancients obſerved not to make the number of *Steps* even, to the end that beginning to aſcend with the right foot, they might end with the ſame foot, which they took to be a good *Omen*, and with greater devotion ſo to enter into the Temples.

## CHAP. XLV.

### Of Divers manners of Stairs.

STtairs are made Straight or Winding: The Straight are made ſpread abroad into two branches or paſſages; or ſquare, which turns into four branches or paſſages; and to make them in this laſt manner,all the ſpace muſt be divided into 4. parts, whereof 2. muſt be for the *Stairs*, and two for the vacancy; the middle whereof if it be open, the *Stairs* receive light. They may be made with a wall within, and then within the two parts which are taken for the *Stairs*, the thickneſs of the wall ought to be comprehended and incloſed, which makes the *Caſe* or *Newel*; they may alſo be made without a wall within: Theſe two ſorts of *Stairs* were made by the Invention of *Seignieur Lovis Cornaro*, a Gentleman of an excellent Judgment.

*Winding-Stairs*, ſome are made round, ſome oval, ſome with a *Newel* in the middle, and ſome open; and ſuch *Winding-Stairs* are made chiefly where there is little room, becauſe they take up leſs room then the ſtraight *Stairs*, yet not ſo eaſie to aſcend. Thoſe which are open in the middle are very handſome, becauſe they may have light from above, and thoſe who are above may ſee thoſe who are coming up, and are alſo ſeen by them.

Thoſe which have a *Newel* in the middle, having but little room, are made in this manner: You muſt divide the Diametre into twelve parts, ten whereof are for the *Stairs*, and the two which remain are for the *Newel* in the middle; or divide the ſaid Diametre into eight parts, ſix whereof are for the *Steps*, and two for the *Newel*; and if there be much room, you muſt divide the Diametre into three parts, whereof two are for the *Stairs*, and one for the *Newel*, as in the deſign A; or otherwiſe, you may divide the Diametre in ſeven parts, of which take three for the *Newel* in the middle, and four for the *Stairs*. Juſt in this manner is the *Stair-Caſe* of the Column of *Trajan* at *Rome*: and if you make *Stairs* winding as in the deſign B, they will be handſomer and more agreeable, and longer then if they had been ſtraight; but to *Stair-Caſes* open in the middle, the Diametre muſt be divided into four parts, two whereof muſt be for the middle, and two for the *Stairs.*

Beſides the faſhion of *Stairs* which are in practice, there hath been a *Winding-Stair* invented by *Mark Anthony Barbaro*, a Gentleman of *Venice* of an excellent Judgment, who made excellent experiments in very narrow places, where there is no *Newel* in the middle; and the *Stairs* in their turning are much longer, and are divided after the manner aforeſaid.

Thoſe which are oval divided in the ſame manner as the Round; they are very handſome and pleaſant, becauſe all the *Windows* and *Doors* are in the middle and head of the oval, and are very commodious; I have made one open in the middle in the Monaſtery of *Charity* at *Venice,* which hath ſucceeded very well.

There is another very handſome manner of *Stairs* which King *Francis* the Firſt cauſed to be made in the Caſtle of *Chambor* near *Bloyſe*, and is in this manner; there are four *Stair-Caſes* which have four Entrances, to wit, one Entry to each, and go up the one over the other in ſuch manner, that being made in the middle of the Building, the four may ſerve for four Appartments; ſo that the Inhabitants of one need not go up and down the *Stairs* of the other; and becauſe it is open in the middle, they all ſee each other go up and down, without any hindrance the one to the other. This Invention being new and handſome, I have placed it here, and marked with Letters from the foot to the head, to the end every one may ſee where each *Stair* begins, and where it ends.

There was alſo to the *Porticos* of *Pompey* at *Rome,* leading to the place of the *Jews*, *Winding-Stairs* of an admirable form; for being placed in the middle, in ſuch manner that they could not receive light but from on high, they were ſet upon Columns, to the end that the light might diſtribute it ſelf to all parts alike; according to which example, *Bramante*, an excellent Architect in his time, made one of them at *Beluedere,* and without *Steps*, having the four Orders of Architecture, *Dorick*, *Ionick*, *Corinthian*, and *Compoſita*. To make theſe *Stair-Caſes*, you muſt divide

vide the whole ſpace into four parts, two whereof are for the void place in the middle, and one on each ſide of the *Steps* and Columns.

There are many other faſhions of *Stair-Caſes* in Ancient Edifices, as *Triangulars*; and of this ſort are thoſe of the Cupolo of St. *Maria Rotunda*, which are open in the middle, and receive light from above: Thoſe alſo which are at *Sancto Apoſtolo* in the ſame City, by which we go to *Mount Cavello*, which are very magnifick, and they are double. Many perſons have taken the model thereof, and carried it to a Temple on the top of the Mountain, as appears in my Books of *Temples*; and of this ſort is this laſt deſign.

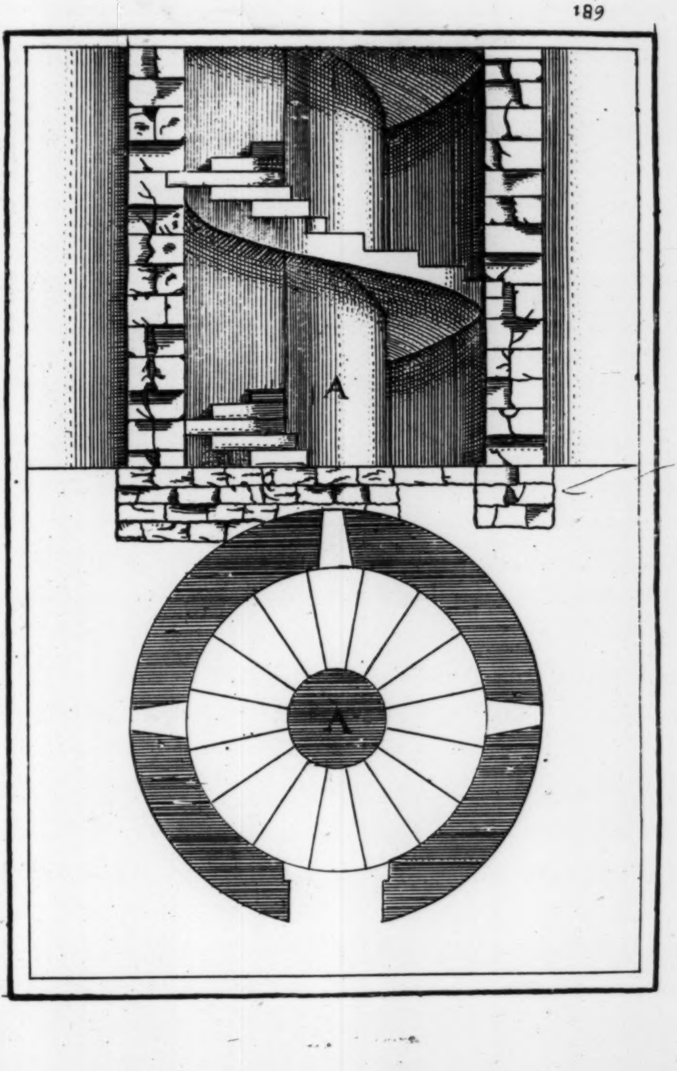
You muſt note, that in *Stair-Caſes* which are ſquare or oblong, when you are conſtrained to place *Steps* in the Angles, in turning you cannot make more then ſix in a Semicircle, which are three in $\frac{1}{2}$ of a Circle, and is then, when the *Stair-Caſe* ſhall have but ſix or ſeven foot in breadth within work, which is the leaſt that can be made.

To *Stair-Caſes* of eight foot broad, you muſt put eight *Steps* from the Angle, turning to a Semicircle, which will be four to $\frac{1}{2}$ of a Circle.

And to *Stair-Caſes* from nine to ten foot broad, you muſt put ten *Steps* to a Semicircle.

If they have eighteen foot more or leſs, you may make twelve *Steps* to a Semicircle.

You muſt take heed that the landing place of the *Stairs*, which is the ſpace between the wall and the *Steps* which one aſcendeth, and which doth diſtribute to the Apartements, be broader a fourth part at leaſt then the length of the ſaid *Steps*.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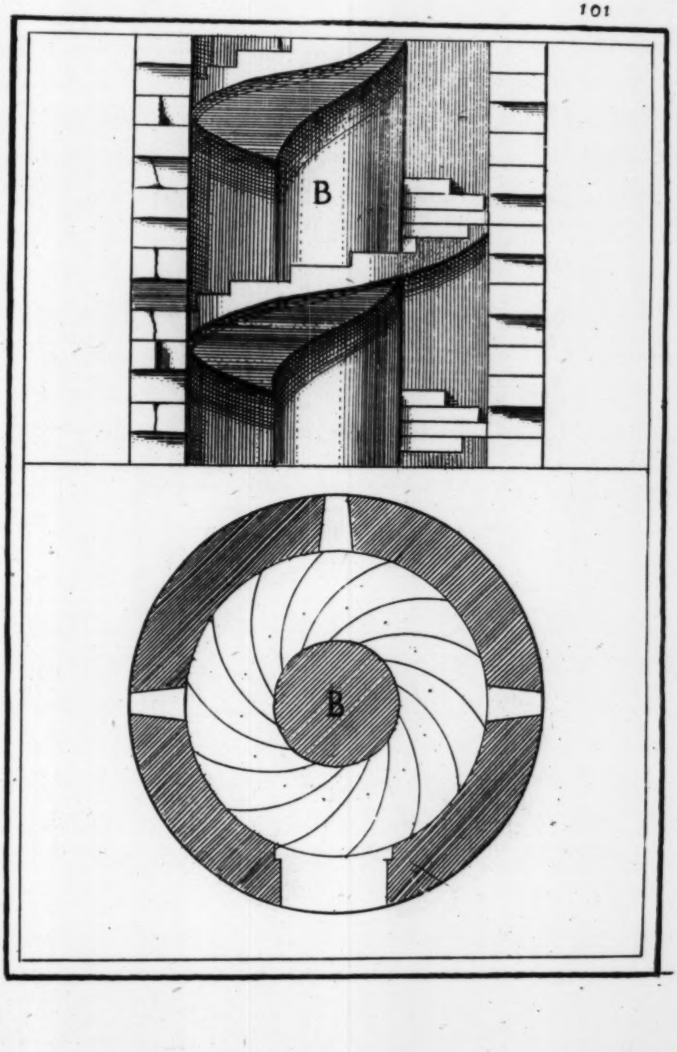
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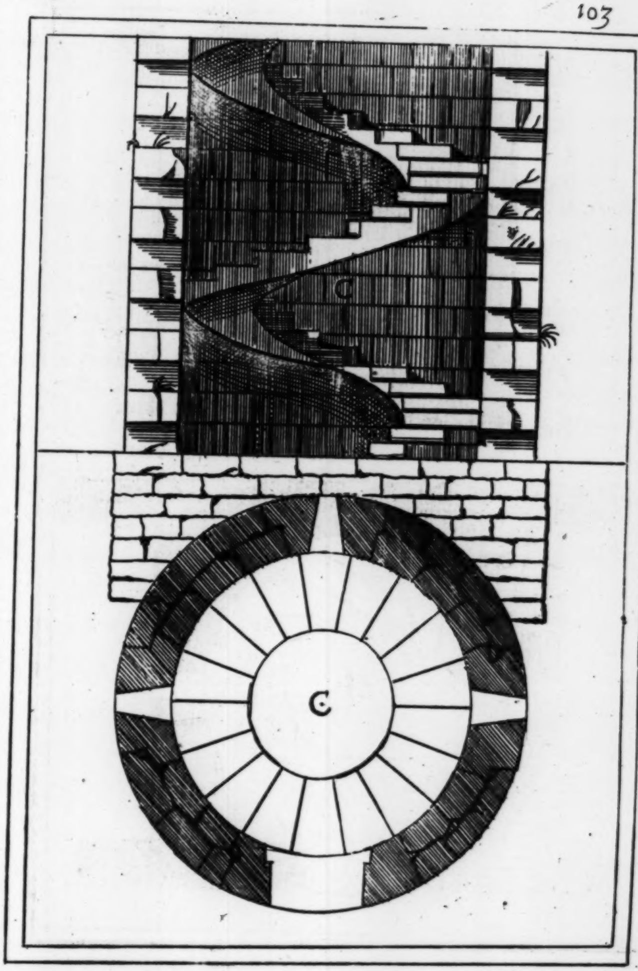
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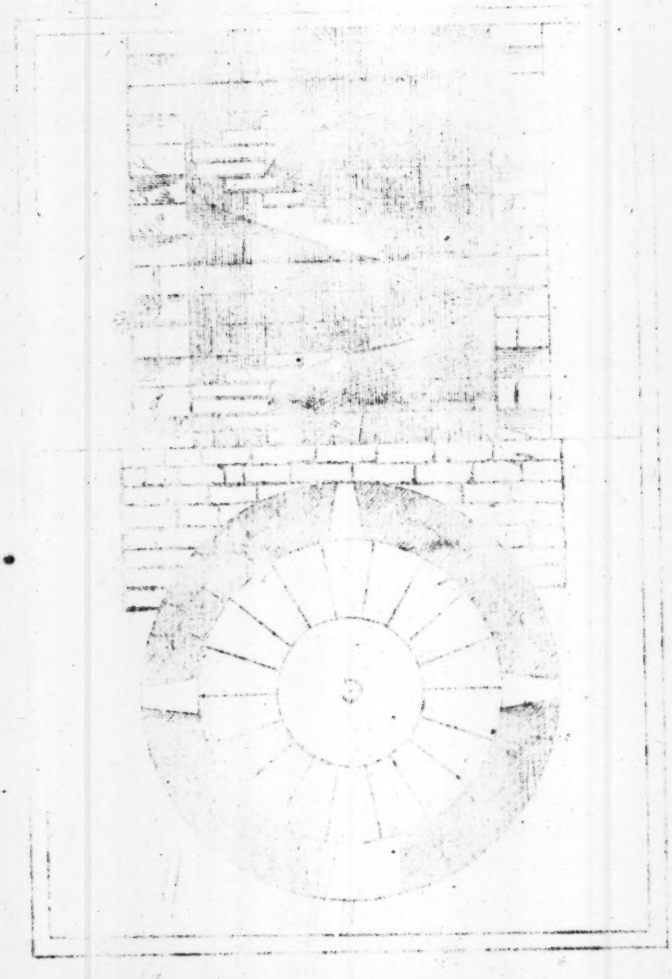

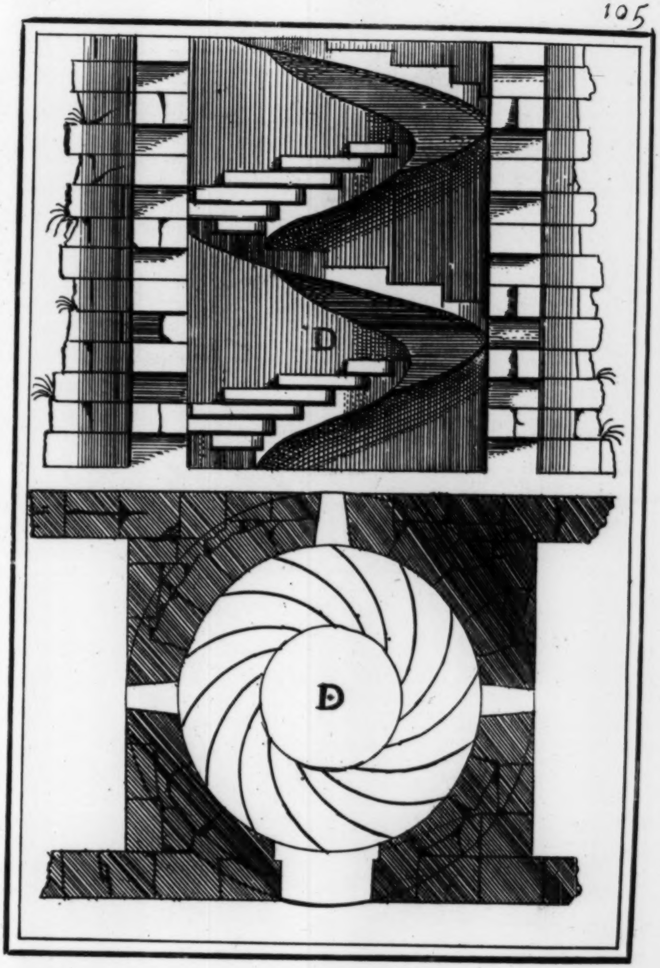
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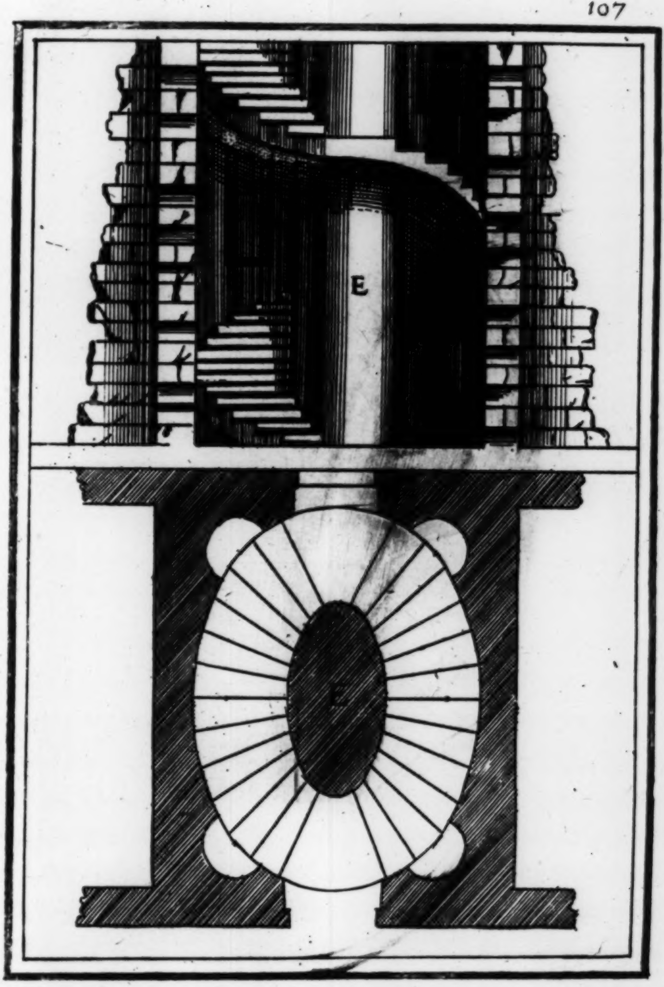
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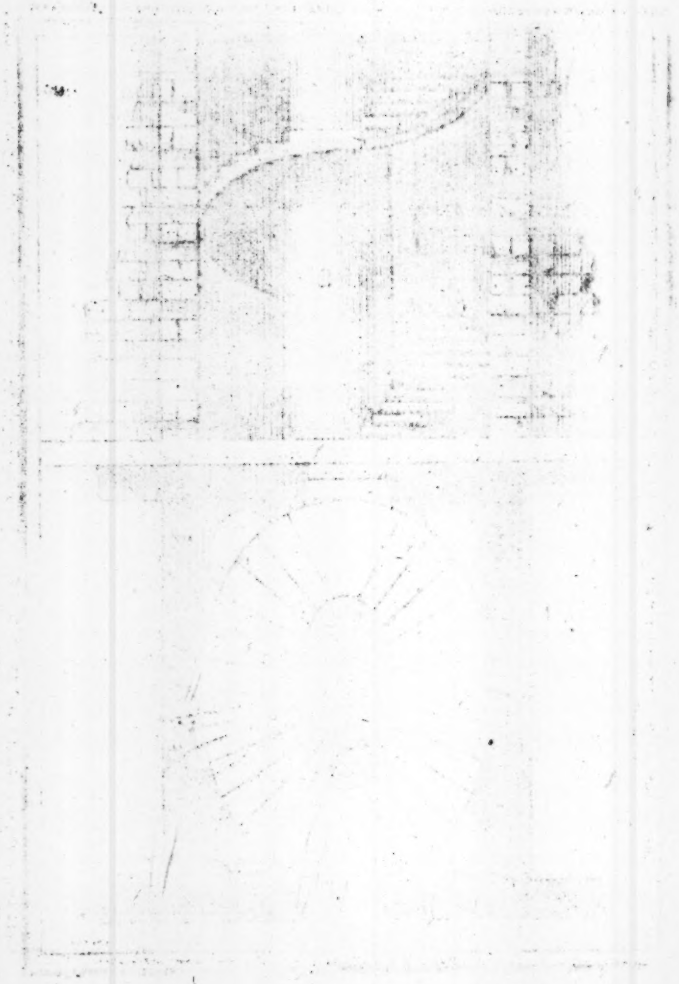

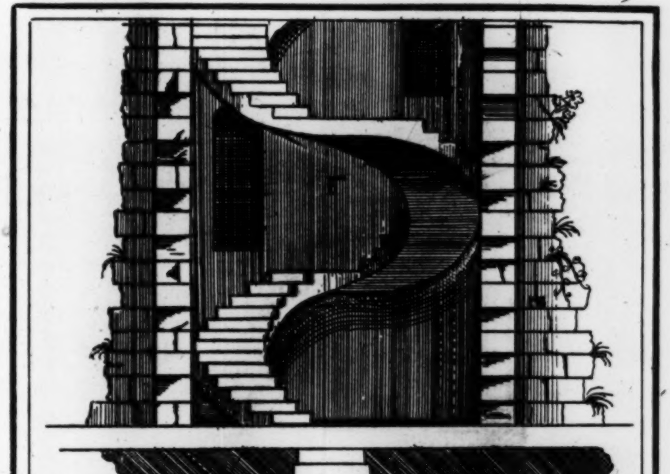
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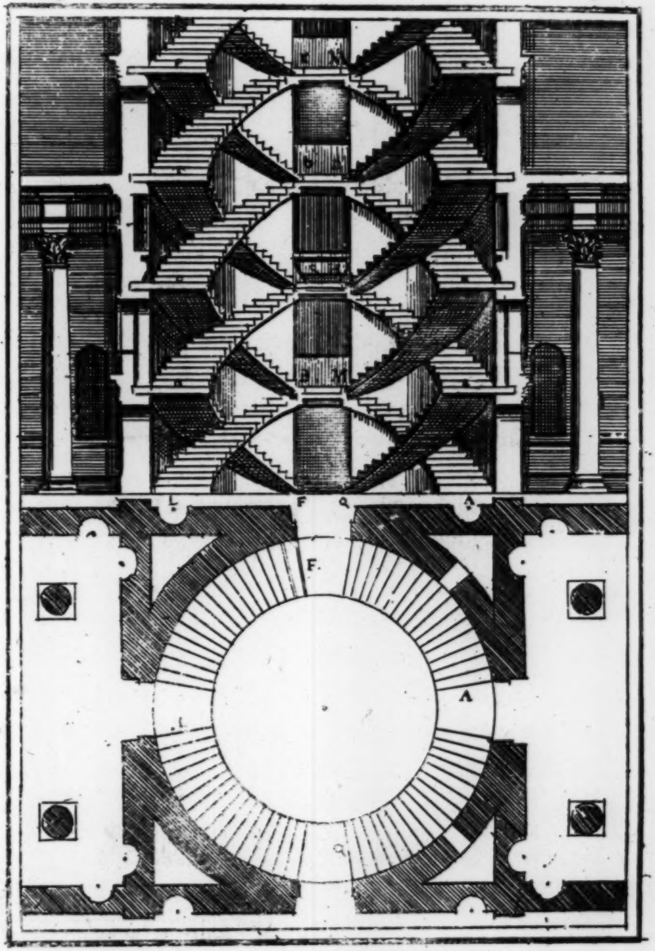
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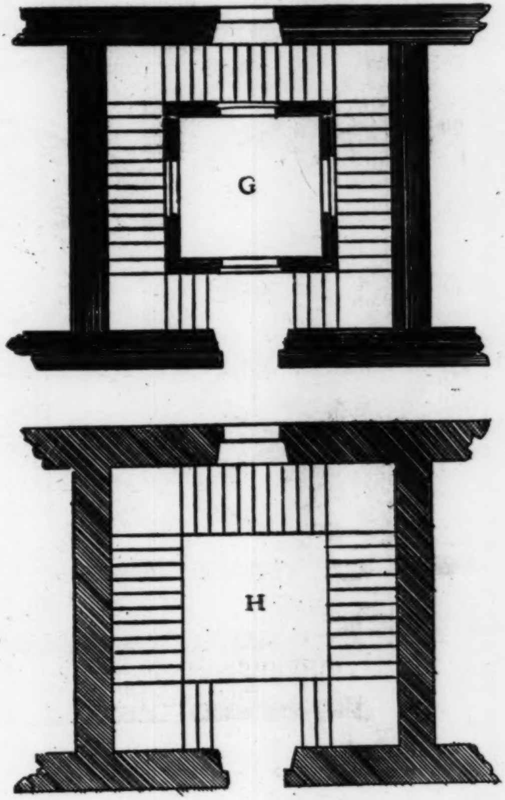
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# OF
# ROOFS.
# RULES
# AND
# INSTRUCTIONS,
# FOR

Framing all manner of *Roofs*, whether Square or *Bevel*, either above pitch or under pitch, according to the beſt manner practiſed in *England*.

Alſo to find the length of the Hips and Sleepers, with the back or Hip-mould, never yet Publiſhed by any Architect, Modern or Antique; a Curioſity worth the Regard even of the moſt Curious Workmen; Exactly demonſtrated in the following Rules and deſigns; by that Ingenious Architect Mr. *William Pope*, of *London*.

## CHAP. XLVI. *Of Roofs.*

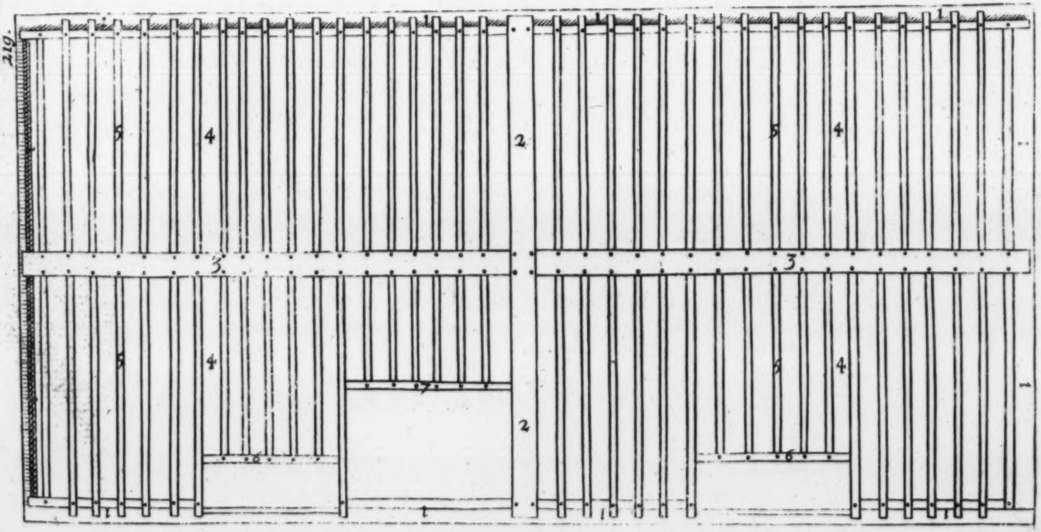
HAving raiſed the Walls to their deſigned height, and made the Vaults, laid the Joiſts, brought up the Stairs, and performed all thoſe things ſpoken of before; we are now to raiſe the Roof, which imbracing every part of the Building, and with its weight equally preſſing upon the Walls, is as a band to all the work; and beſides defends the Inhabitants from Rain, from Snow, from the burning Sun, and from the moiſture of the night; adds no ſmall help to the Building, caſting off from the Walls the Rain-water, which although for a while ſeems to do but little hurt, yet in proceſs of time is cauſe of much Dammage. The firſt Men (as ſaith *Vitruvius*) Built their Houſes with flat Roofs, but finding that thereby they were not defended from the weather, they (conſtrained by neceſſity) began to make them ridg'd (that is to ſay) raiſed in the middle: Theſe Roofs are to be raiſed to a higher or lower pitch according to the Country in which they are; wherefore in *Germany* by reaſon of the great quantity of Snow that falls there, they raiſe their Roofs to a very great pitch, and cover them with Shingles, which are ſmall pieces of wood, or of thin Slate or Tyles; for if they ſhould raiſe them otherwiſe, they would be ruined by reaſon of the weight of the Snow. But we who dwell in a more temperate Country ought to chuſe ſuch a pitch which may ſecure the Building and be of a handſome form; therefore we divide the breadth of the Roof into four equal parts, and take three, which makes the moſt agreeable pitch for our Country, and is the foundation for the raiſing of any manner of Roof, whether Square or Bevel; as appears in the following deſigns and deſcriptions.

*The manner of framing a* Floor, *with the names of each Member.*

1. *THE thickneſs of the Wall, and Lintel, or Wall-plate; and if it be in Timber-work, then a Breſſummer.*
2. *The Summer.*
3. *Girders framed into the Summer.*
4. *Spaces between the Joiſts.*
5. *Joiſts.*
6. *Trimmers for the Chimney way.*
7. *Trimmers for the Stair-Caſe, or well-hole for the Stairs.*

CHAP.

219.



# CHAP. XLVII.

## *Of the Deſign* A.

A. A. THE breadth of the Houſe, *Cantilivers*, *Cornices*, and *Eaves*;
A. B. the length of the Raſtings, and Furrings, which ought to be $\frac{3}{2}$ of the breadth of the Houſe A A.

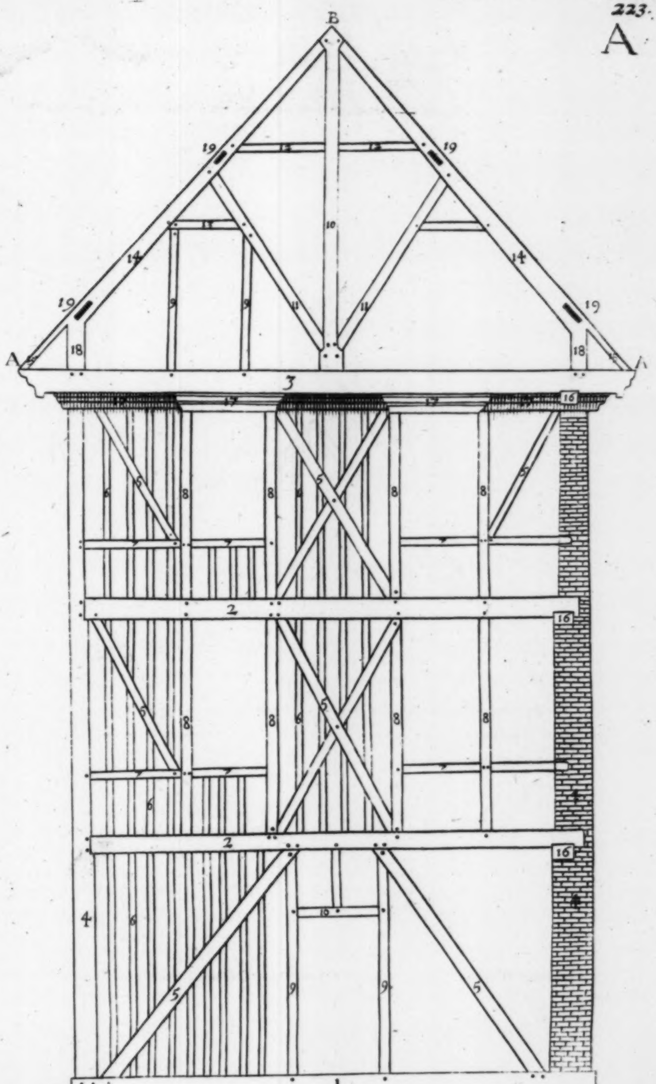
The principal Rafters to be cut with a *Knee* (as in the Deſign) that they may the better ſupport themſelves and the burthen over them upon the upright of the Wall, and alſo ſecure that part from the dripping in of the Rain; which otherwiſe would happen if the Rafters were made ſtraight and furred.

The Beam to the Roof, or Girder to the Garret floor, ought to project without the work, as far as the Furring or Shreading, which is the *Projecture* of the *Cornice*.

This manner of framing the Roof will be uſeful from 20. to 30. foot, or thereabouts.

1. *Ground-Plate.*
2. *Girder, or binding Interduce, or Breſſummer.*
3. *Beam to the Roof or Girder to the Garret floor*
4. *Principal poſt and upright brick Wall.*
5. *Braces.*
6. *Quarters.*
7. *Interduces.*
8. *Prick-poſt, or Window-poſt.*
9. *Jaumes or Door-poſt.*
10. *King piece, or Joggle piece.*
11. *Strutts.*
12. *Coller-beam, Strutt-beam, wind-beam, or top-beam.*
13. *Door-head.*
14. *Principal Rafters.*
15. *Furrings or Shreadings.*
16. *Ends of the Lintels, and pieces.*
17. *Bedding-moulding of the Cornice over the Windows, and ſpace between.*
18. *Knees of the principal Rafters, which are to be of one piece.*
19. *Purline Mortices.*

A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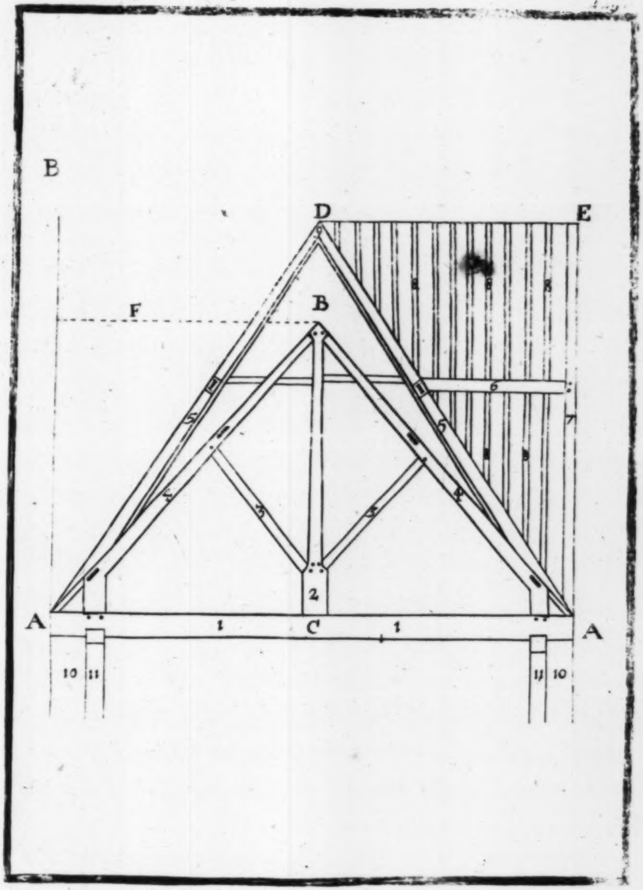B
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# CHAP. XLVIII.

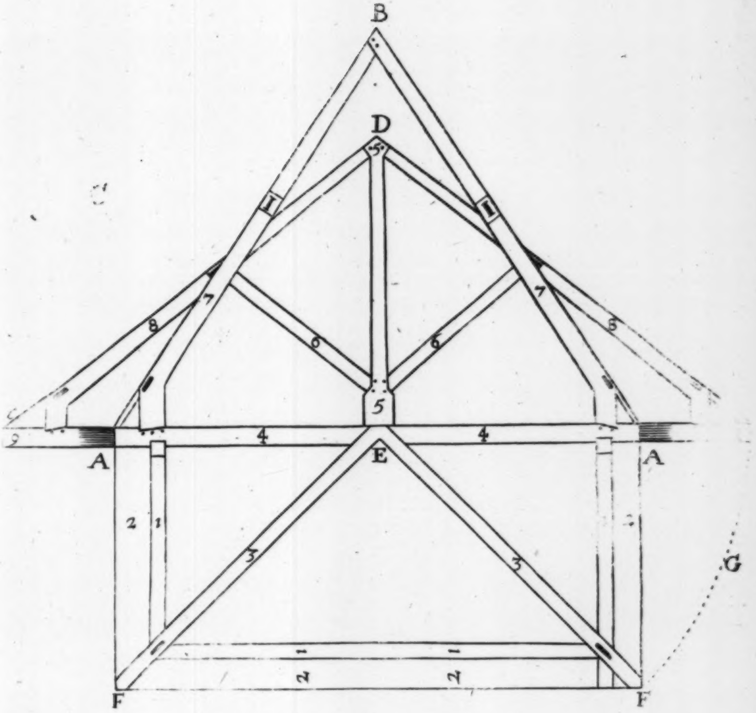
## *Deſign of the* Gable End *or* Roof B.

LET the whole breadth of the *Gable End* or *Roof* A A be 20. foot, divide the ſame into 4. equal parts, take thereof three for the length of the principal Rafter A B, and placing that perpendicular from the point C to the point D, begets the length of the *Sleeper* A D, which will be 18. foot. And the length of the *Dormers* principal Rafter from A to E, when laid to its pitch upon the back of the principals, will reach to the level line F B, or top of the principal Rafter; and this is a general rule for all breadths.

1. *Summer or Beam.*
2. *King piece, Crown poſt, or Joggle piece.*
3. *Braces, or Strutts.*
4. *Principal Rafters.*
5. *The* Sleeper.
6. *Purline of the Dormer.*
7. *Principal Rafter of the Dormer.*
8. *Single Rafter of the Dormer, ſtanding on the* Sleeper *and Purline.*
9. *Point of the* Sleeper.

10,11. *The thickneſs of the Wall and Lintels, or wall-plates.*

CHAP.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## CHAP. XLIX.

### *Of the* Italian *or* Hip Roof C.

A. A. THE breadth of the Roof, being 20. foot.

A. B. The length of the *Sleepers* or *Hips*, being 18. foot, which is proportionable to the breadth of the Houſe.

E. D. The height of the Roof perpendicular.

C. D. The length of the *Hip*, and the Angle which it maketh upon the *Diagonal* line, which is ſhewed by the prick line G, from F to C.

1. 2. *The Wall and Lintels.*

3. *Dragon Beam for the Hip to ſtand on.*

4. *Beam or Summer, wherein the Draggon-Beams are framed.*

5. *King piece or Crown poſt.*

6. *Strutts or Braces from the Crown poſt to the Hip Rafter.*

7. *Hips as they make the Angle equal to the breadth of the Houſe.*

8. *Hips as they make the Angle in the Diagonal lines from Corner to Corner.*

9. *The Additional length which the Hips make upon the Diagonal line, more then the breadth of the Houſe.*

## CHAP. L.

## *Of* Flat Roofs D.

VVIthin a *Camber-Beam* and *Rafters* joggled in, whoſe weight lyeth not chiefly in the middle, and may be ſo made that without hanging up the Beam, the principals may diſcharge the weight; and how Drips may be made to walk on.

1. *Camber-Beam.*

2. *Principals joggled into the Camber-Beam.*

3. *The place where the Principals are joggled in.*

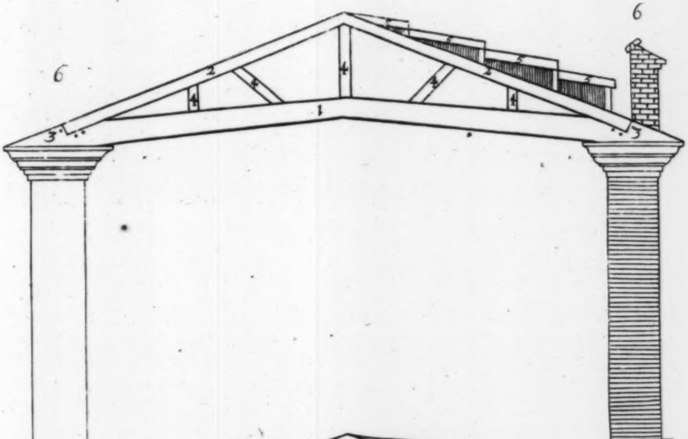
4. *Punchons or Braces.*

5. *Drips to walk on, and may be made with the leſs current that the Roof may be made the more pitch for the ſtrengthening thereof: And may be made higher or lower according to the Building and Diſcretion of the Architect.*

6. *Battlements.*

A Flat Roof, *with a* Crown poſt, *or* King piece.

D.



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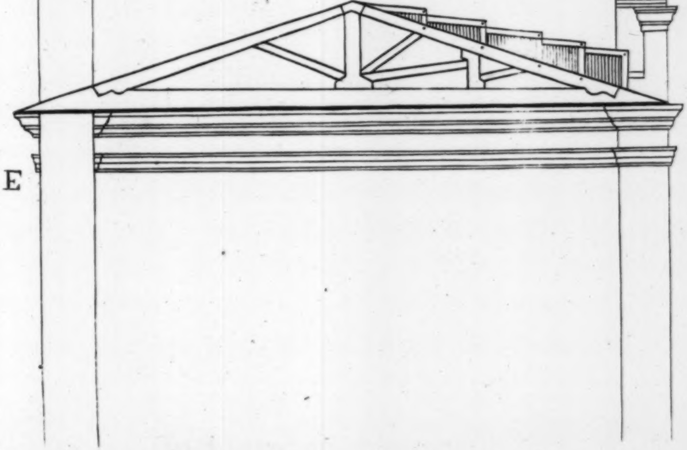

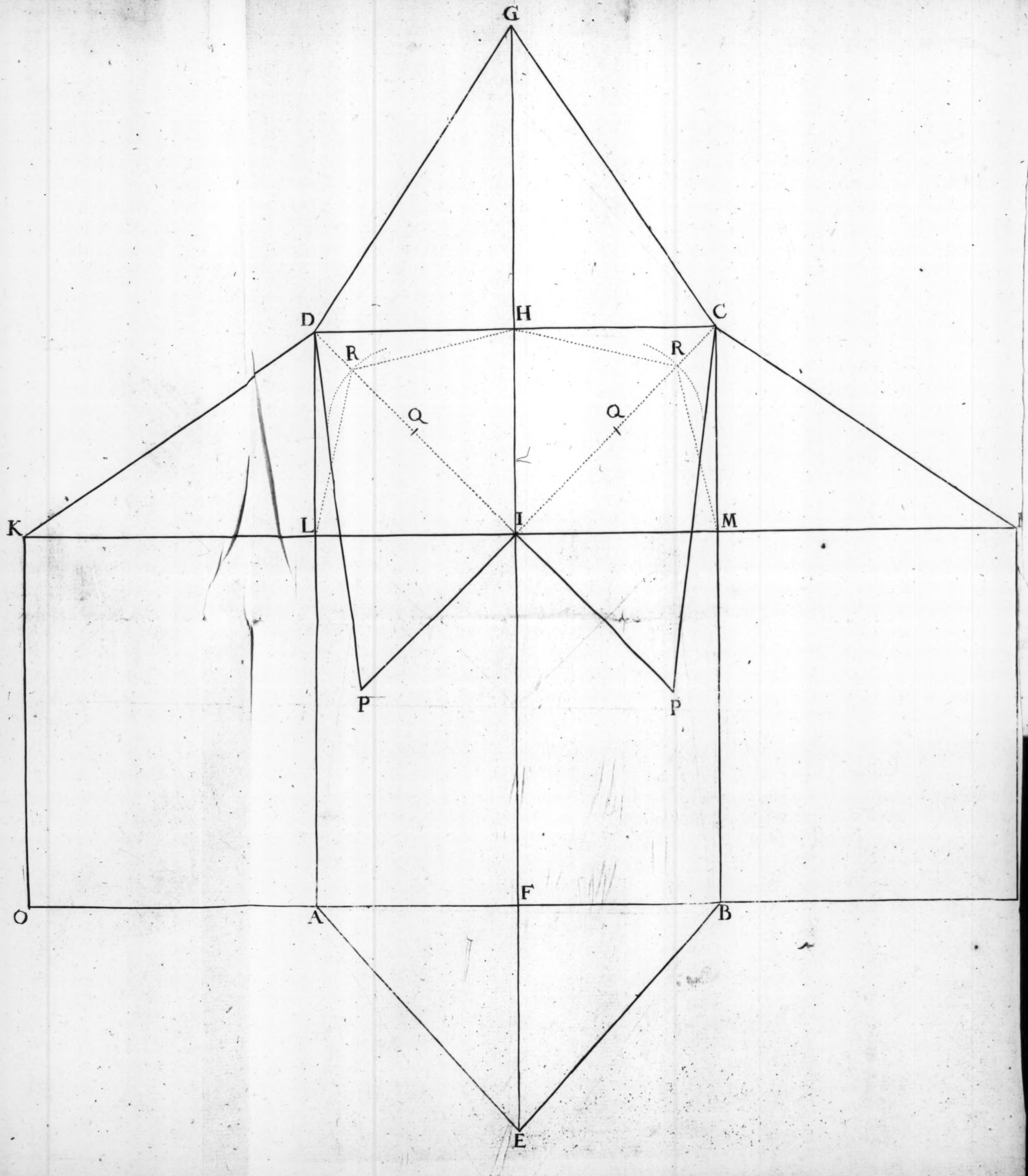
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# CHAP. LI.

## *Of the Hip Roof* E.

INſtructions to find the length and back of the *Hip*, ſo as it may anſwer the ſide and the end ; of the perpendicular line, of the *gable end*, the two Skirts, the ſide of the Roof in *Plano*, or lying in ledgment with the *hip* and *gable end* ; the Diagonal and perpendicular lines being laid down proportional to any breadth or length, by which the moſt Ingenious may ſerve himſelf, and an ordinary capacity ( already acquainted with the uſe of the Ruler and Compaſs ) may plainly demonſtrate all the parts of a Roof whether *Square* or *Bevel*, above *Pitch* or under *Pitch* by lines of proportion, as may appear in the deſign following.

*Suppoſe the Roof* 20. *foot Broad, and in Length* 30. 40. or 50. *foot more or leſs.*

LEt A. B. C. D. be the ſides and ends of the ſaid Roof, one end to be *Hipt*, the other a *gable end*. Draw the lines A. B. C. D. the breadth and length of the Roof. Then draw the *gable end* A. B. E. whoſe ſides or principal Rafters being $\frac{3}{4}$ of the breadth of the Houſe ; then draw the perpendicular line E. F. the heighth of the *gable end*, which line is of general uſe to level the ridge of all Roofs ; and if the other end be *Hipt* as in the deſign D. C. G. then it ſerves to find the length of the *Hip*, and the back of the *Hip*, ſo that it may anſwer both ſides and ends of the Roof, alwayes obſerving that the middle of the breadth of the Houſe is as I. H. then draw the line K. L. N. through the Centre I. which will make right angles to the line E. F. H. G. both in *bevel* and ſquare Houſes. Then extend the line A. B. on both ſides to O. being the length of A. E. or E. B. the length of the principal Rafters or $\frac{3}{4}$ of the breadth of the Houſe. So will O. N. and O. K. make the length of the ridge I. F. and K. D. and C. N. the two skirts.

*To find the length of the Hip.*

DRaw the Diagonal line D. I. and I. C. over which the *Hip* is to hang when in its dúe place ; then take the perpendicular line E. F. and place it from the point I. to P. P. perpendicular to the Diagonal or Baſe lines D. I. and I. C. at I. So is I. P. and I. P. the pitch of the *hip* equal to the *gable end* E. F. and when erected will hang perpendicular to the point I. Then take P. D. the hypotenuſe of the triangle D. I. P. and C. P. the hypotenuſe of the triangle C. I. P. placing them from D. to G. and C. to G. gives the length of the *Hip* D. G. C. and when laid to their *pitch*, will all meet perpendicular to the point I.

*To find the back of the Hip, ſo that it may anſwer both ſides and ends of the Roof, whether Sqare or Bevel.*

LAY the Ruler from the point L. to the point H. and from the point H. to M. and mark where it cuts the Diagonal lines D. I. and I. C. at Q. Q. then ſet one foot of the Compaſſes on the point Q. and extend the other foot to the *Hip* lines D. P. and C. P. at the neareſt diſtance with that mark the point R. upon the ſame Diagonal lines, then draw the prickt lines L. R. H. and H. R. M. which makes the back of the *Hip* for the two corners of that Roof.

This Rule ſerves for all Roofs whether over or under *pitch*.

## CHAP. LII. F

### Of Roof Bevel at one end, and Square at the other; the Gable end Square, the Bevel end Hipt.

SUppoſe the breadth of the Roof 20. foot, the length more on one ſide then on the other, as in the deſign A. B. C. D. then draw the *gable end* A. E. B. whoſe ſides from A. to E. and from E. to B. is $\frac{3}{2}$ of the breadth of the Houſe, or is the length of the principal Raſters; then draw the perpendicular E. F. the height of the Roof from the floor; and if kneed, then from the top of the knee, as in the deſign of a kneed Raſter before-going.

The ſides of the Roof which makes the Ridge G. H. I. K. to be drawn as is deſcribed in the fore-going deſign.

Divide the breadth of the Roof in two equal parts, as F. L. Q. then take the diſtance L. N. which is the $\frac{1}{2}$ breath of the Houſe, and make it parrallel to C. Q. D. as M. L. M. and L. will be the point whoſe perpendiculars O. T. will meet the principal Raſters and *Hips*.

*To find the length of each Hip, diſtinct one from the other.*

*Of the longeſt Hips.*

DRaw the Diagonal line L. C. and take the heighth of the *gable end* E. F. and place it perpendicular to L. C. at O. So have you the heighth of the Roof perpendicular from O. L. equal to E. F. the *gable end*; and the line O. C. will be the length of the *Hip* Raſter, which will be equal to C. H. the skirt for that ſide of the *Hip*, and C. P. the ſide of that *Hip end*.

*To find the back of the longeſt Hip C. O.*

LAY the Ruler from the point M. to Q. and mark where it cuts the Diagonal line at R. then ſet one foot of the Compaſſes at the point R. and extend the other foot till it touch the line C. O. at the neareſt diſtance, then make it touch the Diagonal line at S. then draw the lines M. S. Q. which is the back of the *Hip* for that Corner of the Roof.

*To find the ſhorteſt Hip.*

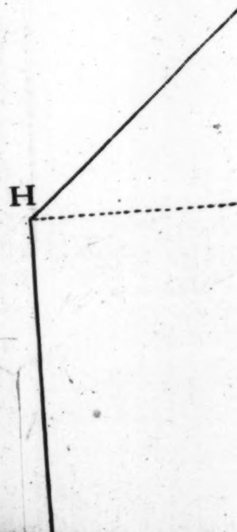
DRaw the Diagonal line of L. D. and take E. F. the perpendicular of the *gable end* as before, and place it from L. to T. perpendicular to L. D. then draw the line T. D. which is the length of the *Hip* for that corner, and is equal to the skirt D. I. and the ſide of that *Hip* D. P. which when erected, will meet with the other principals perpendicular to the point L.

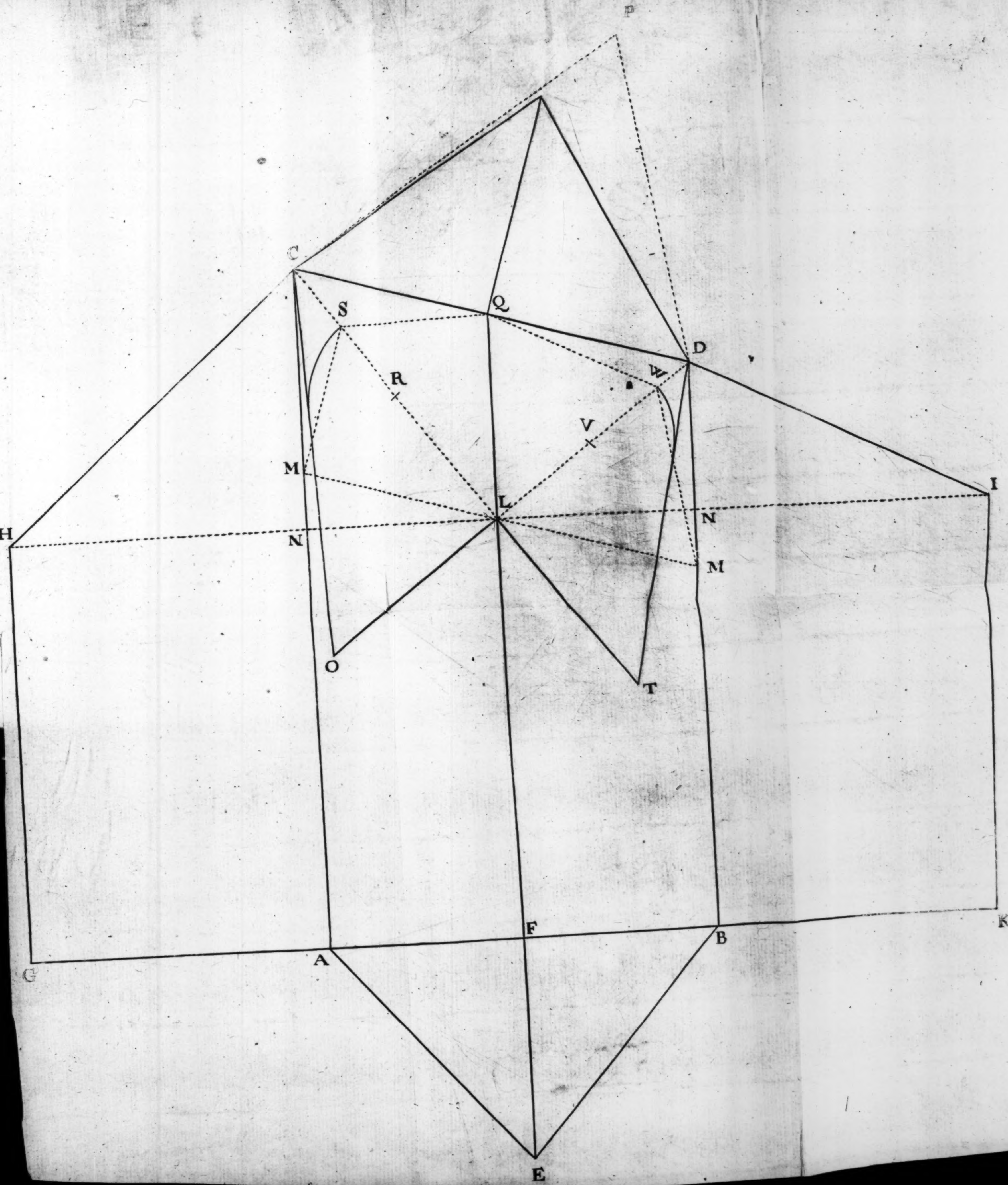
*To find the Back of this Hip.*

LAY the Ruler from the point Q. to the point M. and mark where it cuts the Diagonal line L. D. at V. Extend the Compaſſes from the point V. to touch the line T. D. at the neareſt diſtance, and carry that diſtance on the Diagonal line to the point W. Then draw the prickt lines M. W. Q. which will make the back of that *Hip* fit for that *Bevel* corner.

And this Rule ſerves for all *Bevel* Roofs whether over or under *pitch*.

CHAP.

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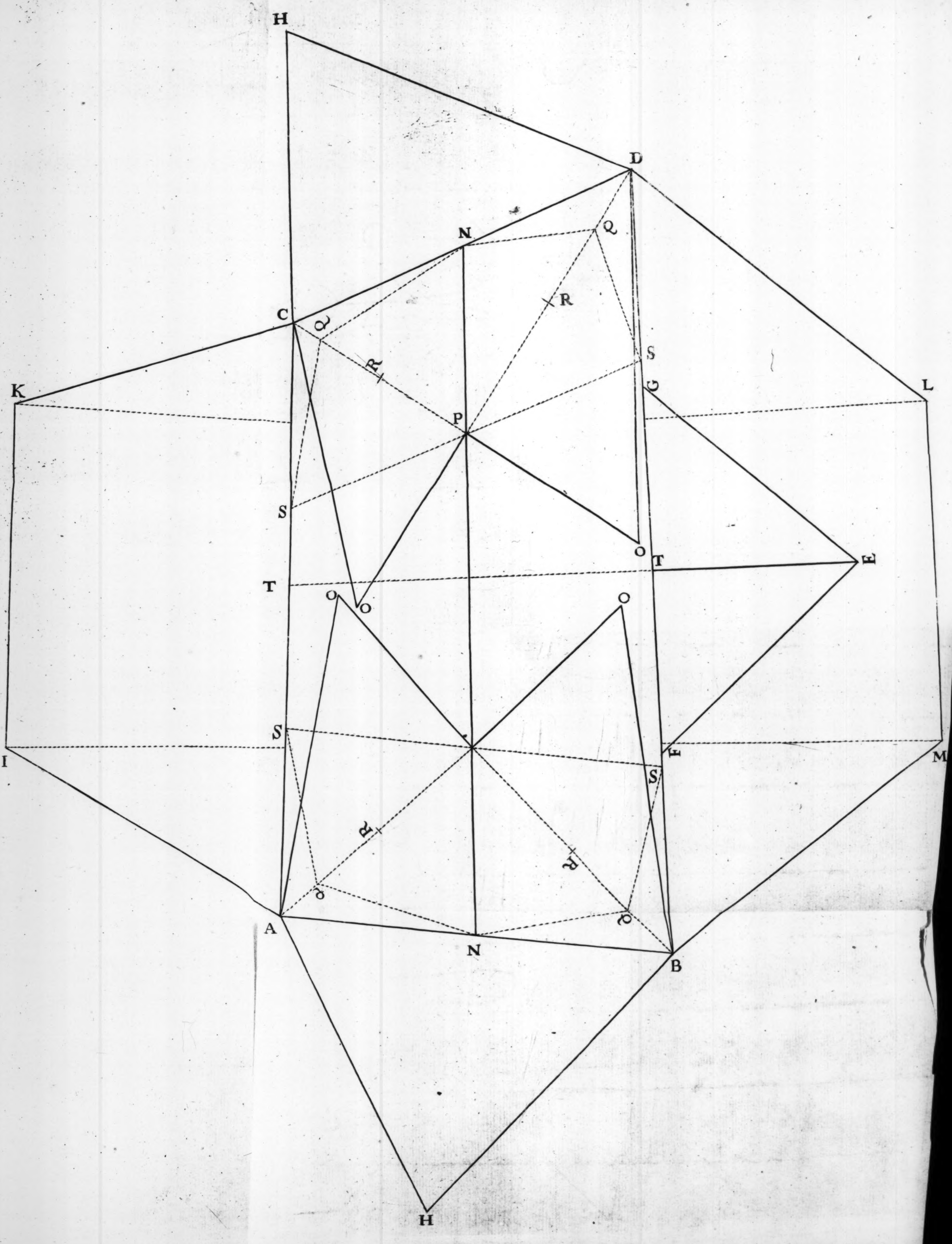
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## CHAP. LIII G.

### *Of a Roof Bevel at both ends, and broader at one end then the other.*

| | |
|---|---|
| A.B.C.D | THE length and breadth of the Houſe. |
| E.F.G. | The length of the Rafters or *pitch* between the wideſt and narroweſt end about the middle of the Houſe, to ſtand over the prickt line T. T. as the foot F. to ſtand on the one T. the foot G. to ſtand on the other T. |
| H.H. | The point of the two *Hip ends* when brought to their due place, will be perpendicular to P. P. and will meet the ſides I. K. L. M. over the points P. P. |
| OOOO. | The points of the perpendiculars and length of the *Hips* from A. B. C. D. |
| Q.Q.QQ. | The backs of the *Hips* or *Hip* mould due to each corner. |
| R.R.R.R | The points to find out Q. the point for each backs. |
| S.S.S.S. | The lines repreſenting ½ the breadth of the Houſe parallel to each end. |
| T.T. | Repreſenting the middle of the Houſe. |

Notwithſtanding the *Bevel* ends you may place your Beams for your principal Rafters to ſtand on, Square, or ſo near a Square as may be, or between both, as from the ends of the prickt lines I. K. L. M. bringing the out-ſide of them ſtraight under P. P. which will be more handſome for the Houſe in the inſide although it *Bevels* outward.

*FINIS.*